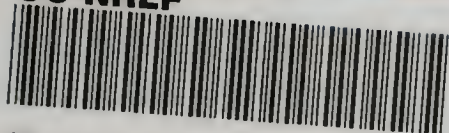


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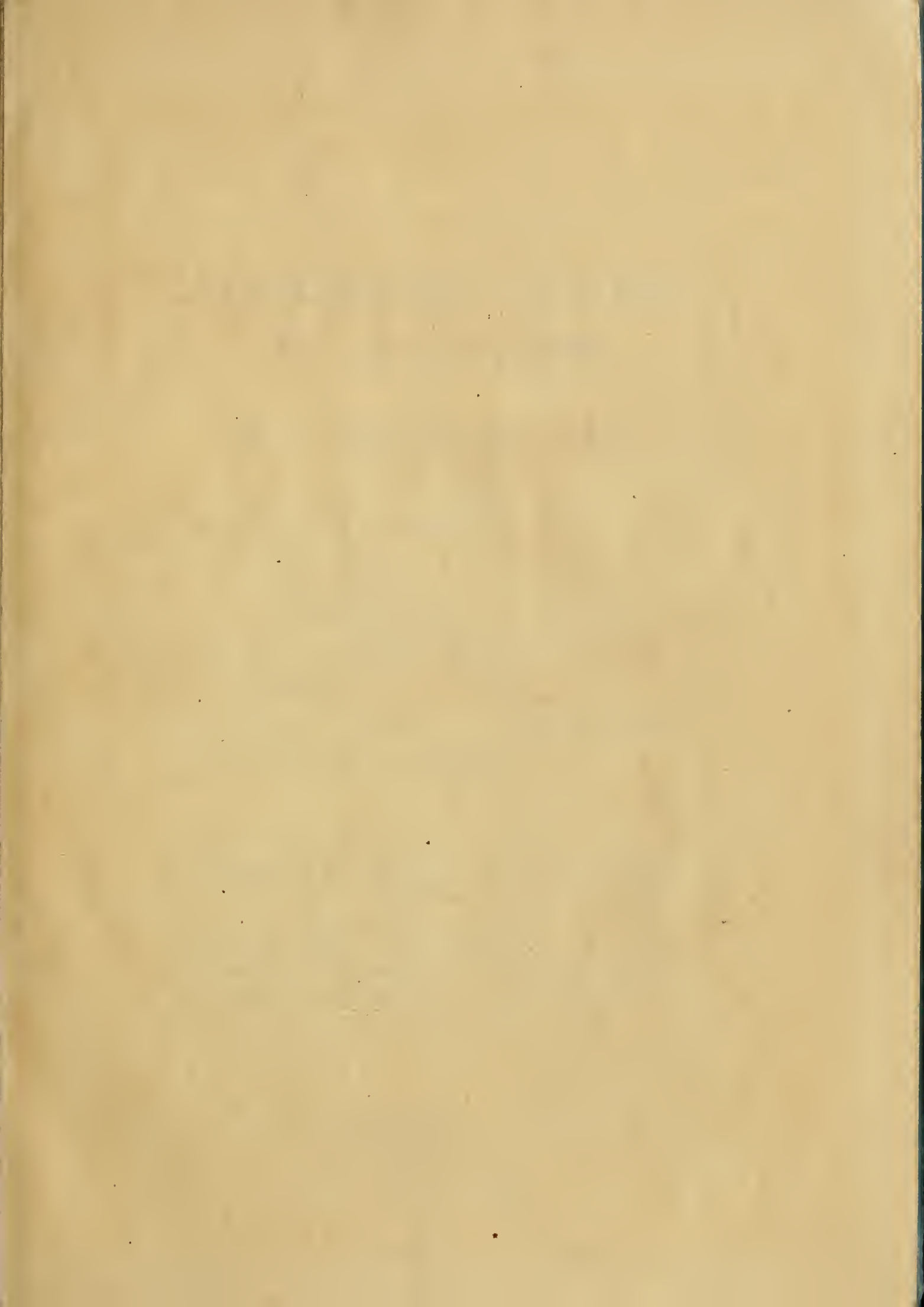
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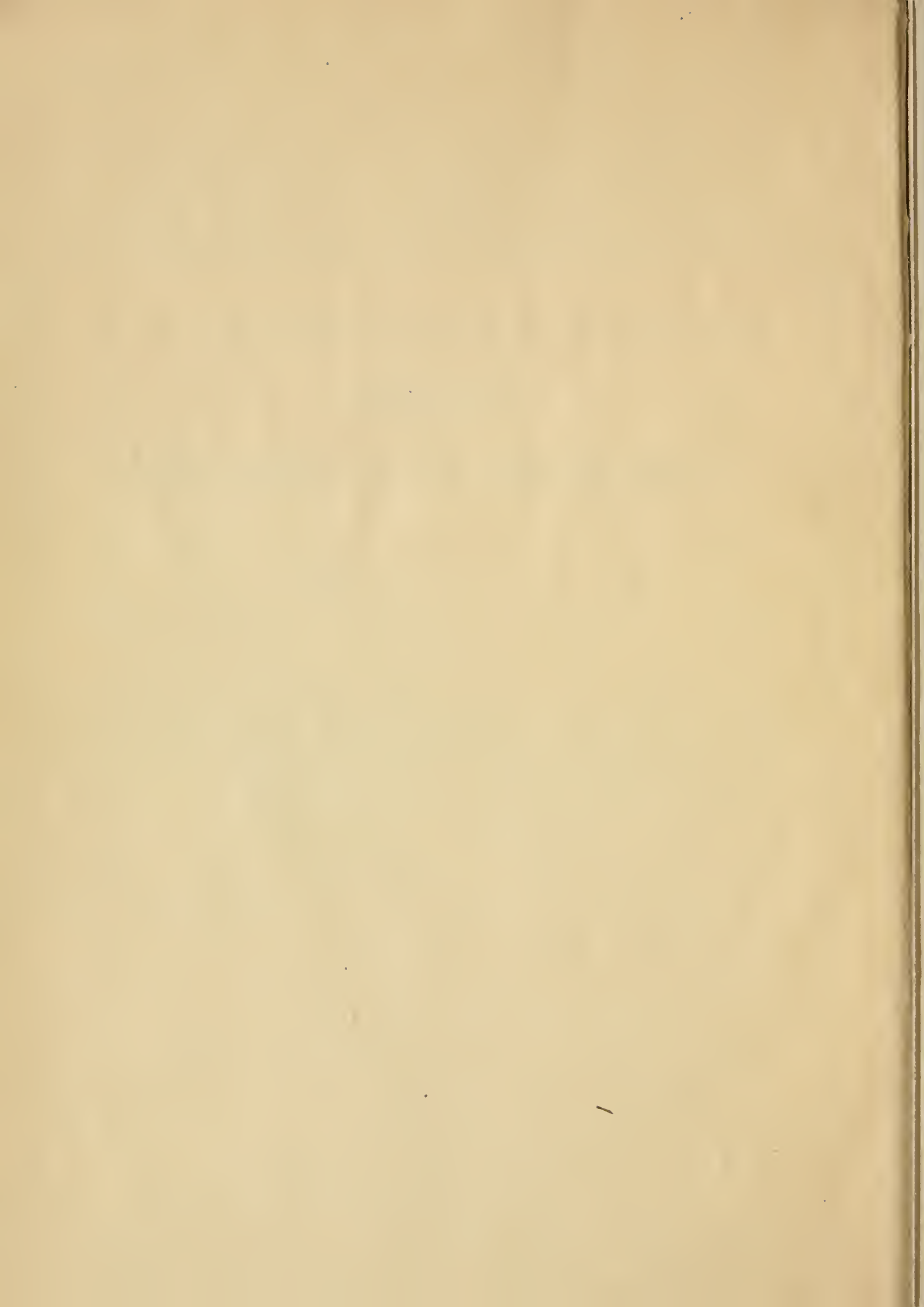
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# ELEMENTARY STUDIES IN GEOGRAPHY

BY

H. J. MACKINDER, M.A.

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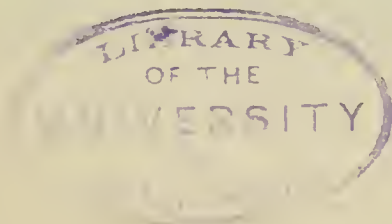
## 3. DISTANT LANDS.

## 4. THE BRITISH EMPIRE.

*In preparation.*

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THESE books will present a coherent system of teaching, each part depending on the previous parts. The first of them, "Our Own Islands," is intended for use in a class midway up an elementary or a preparatory school. The remainder will be issued successively, in ample time for the higher classes as the children move gradually up the school.





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**FIG. 1.—THE FORTH BRIDGE.**

# OUR OWN ISLANDS

## An Elementary Study In Geography

BY

H. J. MACKINDER, M.A.

DIRECTOR OF THE SCHOOL OF ECONOMICS AND POLITICAL SCIENCE IN THE  
UNIVERSITY OF LONDON, AND LATELY READER IN GEOGRAPHY  
IN THE UNIVERSITY OF OXFORD

*Author of "Britain and the British Seas"*

WITH FOURTEEN COLOURED MAPS, EIGHTEEN COLOURED  
PLATES, AND 130 TEXTUAL ILLUSTRATIONS  
AND SKETCH MAPS

SECOND EDITION, REVISED

LONDON

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GENERAL

## NOTE TO SECOND EDITION

Effect has been given in this edition to several suggestions which have reached me, but teachers will like to know that no change has been made in the paging.

H. J. M.

*June, 1907.*

## PREFACE

IN this little book an attempt is made to teach some geography to children, with a human meaning in each chapter, and no unnecessary names. I do not pretend to begin at the beginning, for the first steps must be trodden with the help of the living teacher alone. Along what path those steps should be guided I have discussed in lectures on the study of geography which I hope shortly to publish.

Nor have I tried to make each sentence evident, and to remove all difficulties, for I have assumed that the teacher will supply illustrations according to the locality of his school, and as the knowledge and aptitude of his pupils may require. My object has been to stimulate and lead oral instruction, not to supplant it.

Above all it is necessary that every paragraph should be *realized* upon the map, for the essence of good geography is that it should be accurately imaginative. If the successive steps be taken in logical order, and with some patience, children may acquire, comparatively early, a surprising command of the meaning even of a contoured map, and a delight in reading it. But the first

stages must be carefully traversed, and therefore in the earlier of these chapters a central part of Britain is slowly described, but afterwards, when the map habit of thought has been won in some degree, a large area of the country is covered more rapidly. The North of England has been chosen for the purpose of commencement, not only because it is central in the United Kingdom, but also for its large and simple, yet emphatic topography. The neighbourhood of London is less suitable for the purpose, though London teachers will of course use local topography in the stage of "Home" Geography which should precede the aid of a text book.

Exercises upon the map are proposed in almost every chapter, and these must on no account be omitted, but rather multiplied as time and local circumstance may permit and suggest, for the activity and the imagination of a child are interlocked. Moreover, flexible accuracy of method is thus cultivated, not the rigid accuracy—less desirable—of quotation.

No picture has been inserted for a merely decorative end, and the pupil should be led to question each view, as well as diagram, to ascertain the contribution intended to the meaning of the letterpress. For the convenience of binding a necessarily cheap book, a few of the larger views and coloured maps have had to be placed away



from their context, but reference is made to them by number in the pertinent chapters.

Designedly, I have broken the treatment of England and have interpolated the chapters on Scotland, Ireland, and Wales, for the essential contrasts of our land are only appreciated when it is considered whole.

Britain is described in this book according to progressive methods. It may therefore be advisable to turn back at certain stages in order to apply each new method to the districts already dealt with, especially if one of these happens to be the Home District. For instance, the orographical method employed in the description of Wales may obviously be applied either to a part of Ireland or of Scotland or of the North of England. Similarly the historical method employed in the description of London may be applied to Dublin or Edinburgh.

The necessary ordnance maps are to be had for school purposes at a reduced rate through the Geographical Association.

Certain matters commonly included in the political geography of our country are reserved for comparison with other lands in the next book of the set of four. Together these books are intended to provide a sequence of teaching through the latter half of the elementary or preparatory stage of education.

H. J. MACKINDER.

LONDON, *October*, 1906.

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# OUR OWN ISLANDS.

## CHAPTER I. OUR ISLAND HOME

It is the land that freemen till.

—TENNYSON.

THIS free land, of which the poet Tennyson has written with pride, is our home. It consists of two large islands off the west coast of Europe.

They were called the British Isles by a Greek writer more than two thousand years ago, and that has been their name ever since. The Romans, in the Latin tongue, called the larger of them Britannia, and the smaller Hibernia. To-day, in English, we speak of them as Great Britain and Ireland. But we often call the whole British Isles merely Britain, because one word is more convenient than two or three.

On the globe you will see the British Isles as two little specks beside the vast land which is known as the Old World. This land consists of three parts, Europe, Asia, and Africa. It spreads for six thousand miles eastward of Britain to the end of Asia, and for six thousand miles nearly southward of Britain to the end of Africa.

We who live in the British Isles often refer to the mainland simply as "The Continent." It is nearly three hundred times as large as our

islands. Yet these islands are the home of one of the strongest nations, and colonists have gone out from them who to-day form sister nations in America, Australia, and South Africa.

Let us try to find out how so small a country can be the home of so great a people. Remember that it is not only size that tells, and that some of



FIG. 2.—A VOYAGE ROUND THE WORLD. (See also Fig. 3.)

the cleverest and best men are often small men. In the same way these islands, though small as compared with the Continent, are in many things very fortunate.

They have a climate which in most years is not too hot in the summer or too cold in the winter, so that men are able to work hard all the year round.

Buried in their rocks are great stores of coal and iron, so that Britain has grown rich by manufactures. But the most fortunate thing of all is the fact that they are islands, and that the sea around them divides them from the Continent.

For many centuries no army has been able to cross the sea and to conquer Britain, though a



FIG. 3.—See Fig. 2 opposite.

You should follow this voyage also on a globe.

hundred years ago the French Emperor Napoleon assembled a great army at Boulogne, a place in France from which you can see Britain across the water. But Admiral Nelson defeated the French Fleet at Trafalgar, and no one has since attempted to invade us. Therefore we have had the great blessings of peace and freedom at home.



Look again at the globe, and you will see that the British Isles are divided from the Continent on the east and on the south by water which is not very broad. This water is often spoken of as the Narrow Seas.

On the other hand, to north and to west there spreads out the vast Atlantic Ocean. A ship can

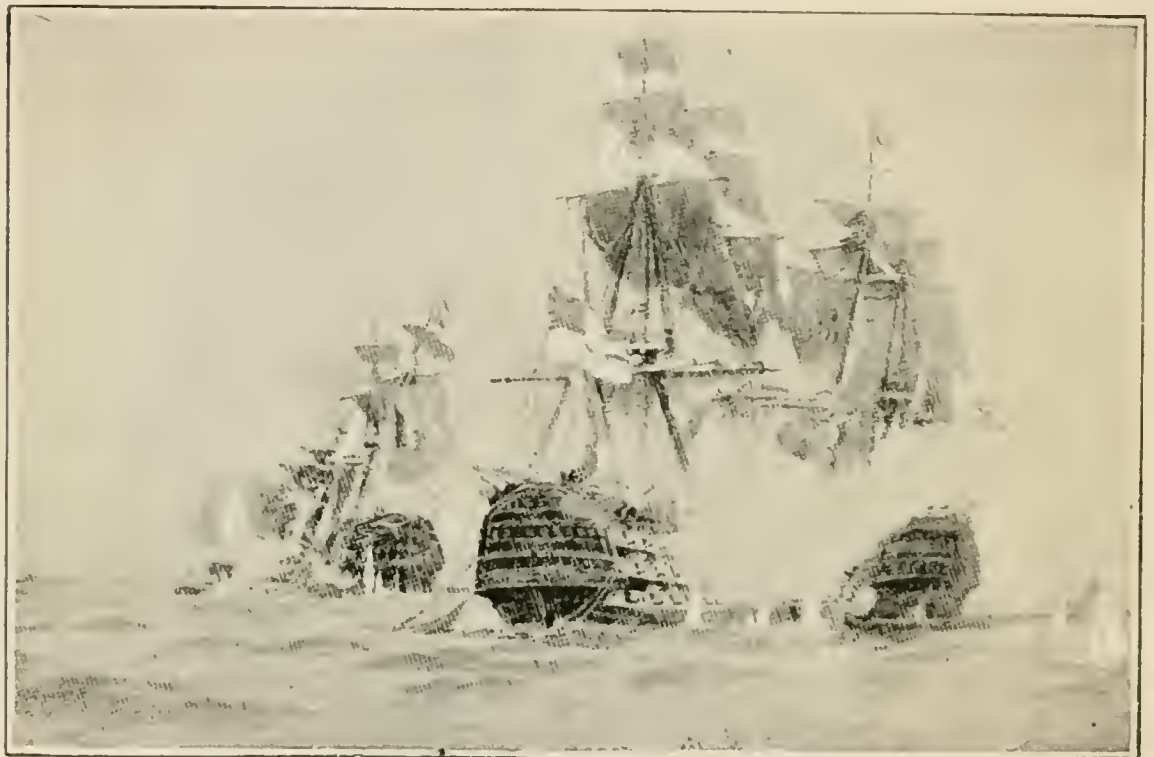


FIG. 4.—THE BATTLE OF TRAFALGAR.

leave Britain, and steaming over the water of the Atlantic, can go southward for several thousand miles. Turning round the Cape of Good Hope, at the end of Africa, it can steam on eastward for several thousand miles more to the great island of Australia. Then, keeping always eastward for yet more thousands of miles, it can pass round



Cape Horn at the end of South America, and so come again into the Atlantic Ocean. Steaming northward through this ocean it returns once more to Britain, having made a voyage round the world.

Therefore the ocean whose waves beat upon the shores of Britain is the great high road upon which the ships come and go, carrying our trade to all the shores of the world.

It is clear, then, that our island home is fortunate in at least four different ways. It has a climate in which we can be strong and active ; it has great wealth of iron and coal ; it is protected by the sea, so that we have peace and freedom at home ; and it is surrounded by the ocean, upon which we can go out into all the world to do commerce and to found colonies.

## CHAPTER II. THE NARROW SEAS

As a moat defensive to a house,  
Against the envy of less happier lands.

—*King Richard II*, SHAKESPEARE.

IN these lines our greatest poet, Shakespeare, tells us that he thought Britain happier than other lands. The reason he gives is that we are defended by the sea.

Shakespeare thought thus, because in his time, three hundred years ago, the King of Spain, who was then a very great king, got ready an army in Belgium to attack England. Belgium at that time belonged to Spain, and the King sent his fleet, which was called the Great Armada, to bring his army over from Belgium to England. But the English fleet beat the Armada before it got to Belgium, and so prevented the invasion.

We saw in the last chapter that two hundred years afterwards the French Emperor Napoleon also tried to invade England, but the English again defeated the enemy at sea, and the French army could not cross over.

We must learn something about the water which thus helps us so powerfully to defend our home.

Let us look at this map (Fig 6, p. 9) of the British

Isles and the Narrow Seas. We note that at one point Britain comes very near to the Continent. At its south-eastern corner Great Britain is only twenty miles from the opposite shore.

The narrowing of the sea at this point is called the Strait of Dover. Every day many people come and go across the Strait by quick steamers, which

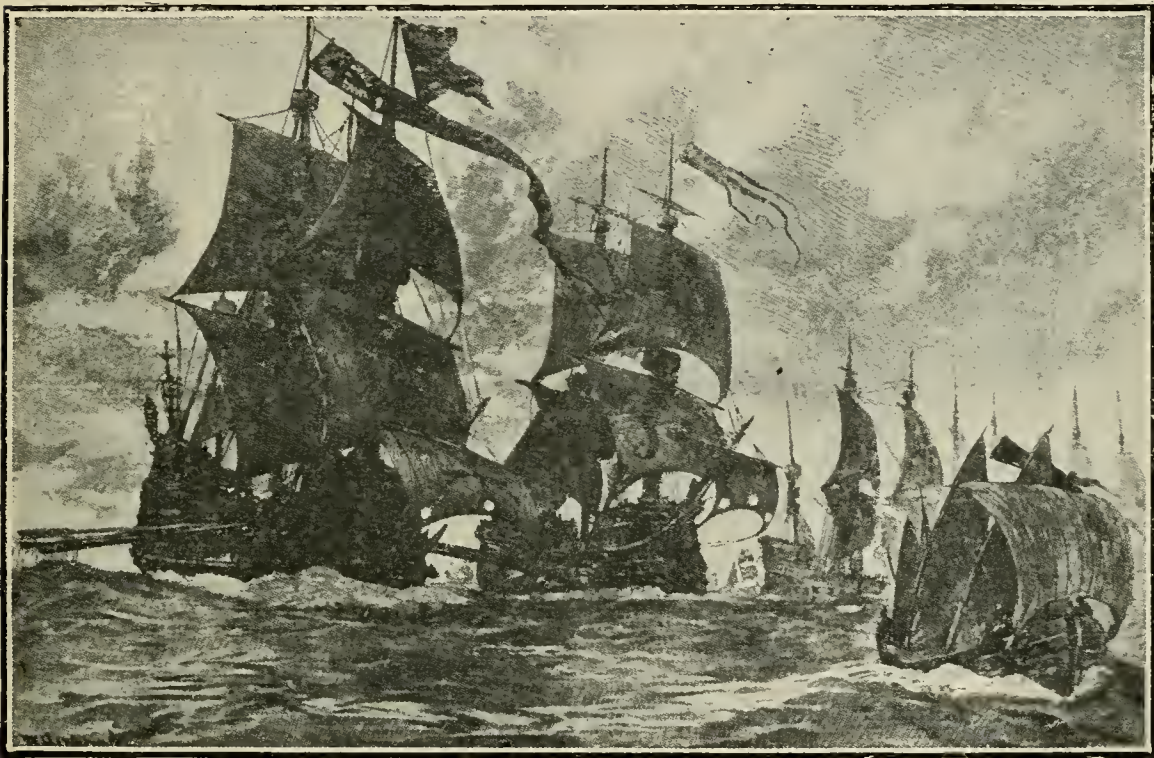


FIG. 5.—THE SPANISH ARMADA.

in fine weather often make the voyage in less than an hour.

When the weather is clear you can see the white cliffs of France as you stand on the Castle at Dover, and at the same time the white cliffs of England can be seen shining in the sunlight from the coast of France. The town in France where



the passengers from Dover land on the Continent is called Calais, and French people speak of the Strait as the Pas de Calais—that is to say, the Strait of Calais, not of Dover.

The sea which divides the British Isles from the Continent widens from the Strait on the one hand into the English Channel, and on the other into the great square of water which is called the North Sea.

The English Channel separates England from France. The French call it the Manche, from their word meaning sleeve, because the Channel has roughly the form of a sleeve upon an arm held out eastward, with the wrist at the Strait of Dover.

In poetry the English Channel is often described as the Silver Streak, for the water of the sea glistens in the sunlight with a sheen like that of silver. Shakespeare, for example, has written of our island as “This precious stone set in the silver sea.” (See Fig. 7, p. 11.)

From the Strait of Dover another arm of the sea bends northward between England on the one side and Belgium and Holland on the other. This arm, which receives from the west the wide mouth of the River Thames, has no special name, but is treated as part of the North Sea.

The water of the North Sea washes all the east coast of Great Britain, and spreading round the





FIG. 6. —THE BRITISH ISLES AND THE NARROW SEAS.

north of Holland, extends along the shores of Germany, Denmark, and Norway. In the midst of it is the Dogger Bank, where the sea is very shallow, and there is great abundance of fish.

Hundreds of fishermen from England, Scotland, Norway, Denmark, Germany, and Holland fish here and send their catch to be eaten in all the lands around (see Plate I, p. 20). There are frequent

storms and fogs in the North Sea, so that the life of the fishermen is a rough and dangerous one.

Many other lines of steamers, in addition to that between Dover and Calais, cross the Narrow Seas between Britain and the Continent. But there is a busy traffic on these seas, not only because of the fishermen, and because of the steamers to the Continent, but also on account of the great ships which leave the ports of the North Sea and the Channel, and go out on to the Atlantic Ocean for voyages of many days.

Sixteen hundred miles away, to the west of Ireland, is another British land on the Continent of America. It is the vast land of Canada. A fast steamer would cross the ocean between us and Canada in six, seven, or eight days, according to its speed.

Think of a colonist who, when young, left some English village and went to settle in Canada. Think of him coming home years afterwards to visit his friends once more. How impatient he would be as hour after hour he saw nothing but sky above him and water all around, and at night when lying in his berth heard the waves chasing one another past the sides of the ship (Fig. 8, p. 12). And think of his joy when the ship entered the English Channel and he saw the lights flashing over the water from his native shores.

There are lighthouses placed on each side of the



English Channel all the way to Dover, so that at night the Channel is like a great water street. Scores of steamers are always moving through it day and night, some, as we have seen, crossing it rapidly from coast to coast, but others going up and down its length, just beginning or ending their long voyages over the ocean.



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*[Payne Jennings.*

FIG. 7.—“THE SILVER SEA.” THE ENGLISH CHANNEL FROM THE CLIFFS AT TORQUAY.

Perhaps the most famous of our lighthouses is that built on the dangerous Eddystone Rocks, off the port of Plymouth, near the mouth of the

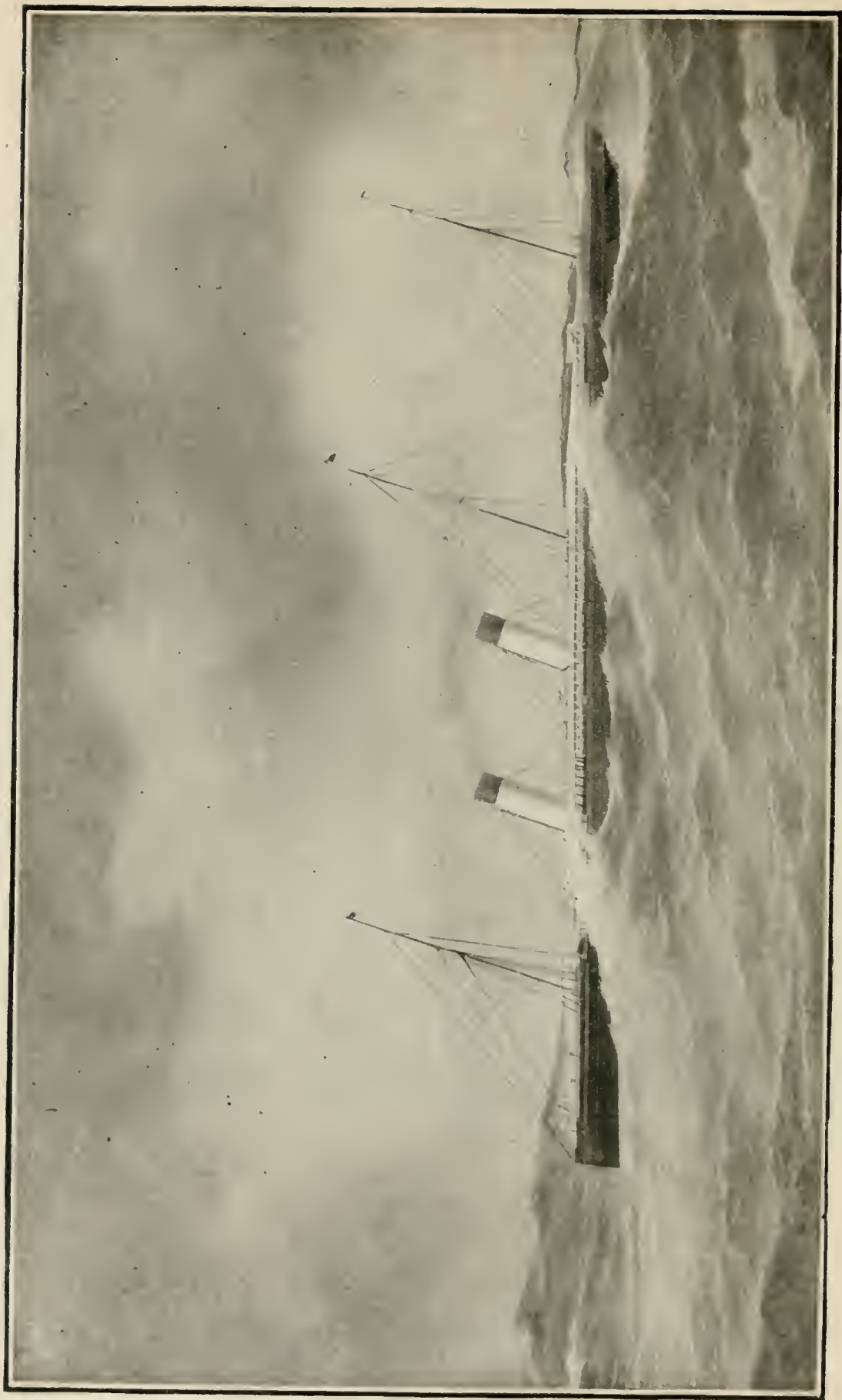


FIG. 8.—A LINER IN A STORM.



English Channel. The great waves coming in from the ocean have been known to throw their spray completely over the top of it. The stump of an older lighthouse stands on the same rocks. It was injured by the sea and had to be taken down. A third and still older Eddystone Lighthouse was swept away in a storm.



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FIG. 9.—EDDYSTONE LIGHTHOUSE.

### CHAPTER III. THE THREE KINGDOMS AND THE PRINCIPALITY

LET us now turn to the map of the British Isles, and let us see why we often speak of the British Isles as the United Kingdom.

The two islands of Great Britain and Ireland are very different in shape and size. Look at Great Britain on the map. It is a long island stretching northward. It consists of two parts, England in the south and Scotland in the north. These were once separate kingdoms, each with its own king, the one ruling in London, the capital of England, the other at Edinburgh, the capital of Scotland.

In the old times there were many fierce wars between England and Scotland. Even to-day they are still to some extent different countries, with different ways and customs. We are very proud of the brave deeds which were done by our forefathers in the days when they were enemies. But the Scotch and English peoples are now happily united in loyalty to the same king.

On the west side of England there are two peninsulas. The larger of these is called Wales. This also was once a separate country, although it has been united to England much longer than



FIG. 10.—THE THREE KINGDOMS AND THE PRINCIPALITY.



has Scotland. The eldest son of the King of England is known as the Prince of Wales, and Wales is therefore often spoken of as the Principality.

A great many people in Wales still talk Welsh, which was the language of the ancient Britons. The Welsh, like the Scotch, are proud of their ancestors who fought against England. But England and Wales are now joined into a single friendly country.

To the south of Wales is the other western peninsula, longer than Wales, but narrower. From its position it is often called the West of England. It terminates in a promontory known as the Land's End. In France, on the opposite side of the English Channel, is another promontory, which is called Brittany. These two headlands, the one in England, the other in France, grasp the mouth of the English Channel like two great piers at the mouth of a vast harbour.

Brittany is called by that name because its people are descended from the ancient Britons, some of whom fled there. Many of them still talk not French, but Breton, a language so like Welsh that the fishermen of Wales and Brittany, when they meet at sea, can understand one another.

To west of Great Britain lies Ireland. It is less than half as large as Great Britain, but has a more rounded outline. The Strait which separates the



north of Ireland from Scotland is called the North Channel. It is only thirteen miles across, and is therefore much narrower even than the Strait of Dover. It is also often called St. Patrick's Channel, from St. Patrick, the patron saint of Ireland.

The strait which separates the south of Ireland from Wales is broader, although on a fine day it is

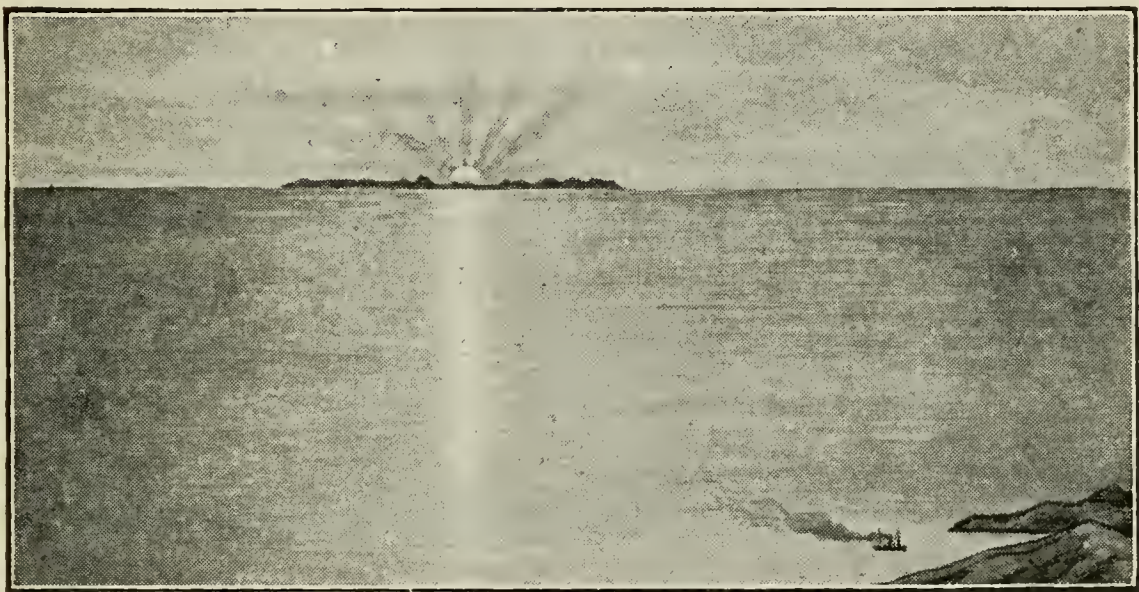


FIG. 11.—VIEW WESTWARD FROM THE SUMMIT OF SNOWDON, WITH THE SUN SETTING OVER THE MOUNTAINS OF IRELAND.

The steamer is entering the Menai Strait.

possible from the tops of the Welsh mountains to see the mountains of Ireland. They form a dark, jagged edge along the western horizon when the sun is setting. This arm of the sea is called the St. George's Channel, from St. George, the patron saint of England.

Almost exactly in the centre of the British Islands is the square Irish Sea, much smaller than

the North Sea. Ships enter it from the north-west by the St. Patrick's Channel, and from the south-west by the St. George's Channel. The four sides of it are formed by the four parts of Britain. To the north is Scotland, to the east England, to the south Wales, and to the west Ireland.

In the centre of the Irish Sea is the small Isle of Man, whose highest mountain is called Snae Fell, which means the Snow Hill, for in the winter it is usually capped with snow. From the top of Snae Fell in good weather you may see on the horizon, in four different directions, the peaks of the Scottish, English, Welsh, and Irish mountains. Thus the Irish Sea differs from the Narrow Seas, which divide Britain from the Continent, because all of its shores are British.

Lines of rapid steamers cross the St. Patrick's and the St. George's Channels from Great Britain to Ireland. The line by which most of the letters are carried runs from Holyhead, at the north-west corner of Wales, to Kingstown, which is close to Dublin, the capital of Ireland.

There are also much larger steamers which pass through the St. Patrick's and the St. George's Channels, plying between America and the great port of Liverpool. If you look for Liverpool on the map, you will see that it is placed at the south-east corner of the Irish Sea, almost exactly in the middle of Britain.



Owing to the way in which the sea divides the two islands, ocean-going ships are able to come from the remotest lands not merely to the outer edge of Britain, but entering the St. George's and North Channels, to reach the very heart of the country. Therefore their cargoes have not afterwards to be carried very far by railway, and this is well, because it costs much more to take goods by train than by ship.

Now we can see why there were once four separate countries in Britain. It was because the sea divided the land into separate islands and peninsulas.

The largest of these countries was the Kingdom of England. The Principality of Wales, in a western peninsula of the island of Great Britain, was early joined to England. The Kingdom of Scotland in the northern end of Great Britain was joined later, when the King of Scotland inherited the Kingdom of England.

These two kingdoms were afterwards still more firmly united, and were called the Kingdom of Great Britain. To this was added the Kingdom of Ireland in the sister island. So that now we have the United Kingdom of Great Britain and Ireland. For shortness we often call it simply the United Kingdom.

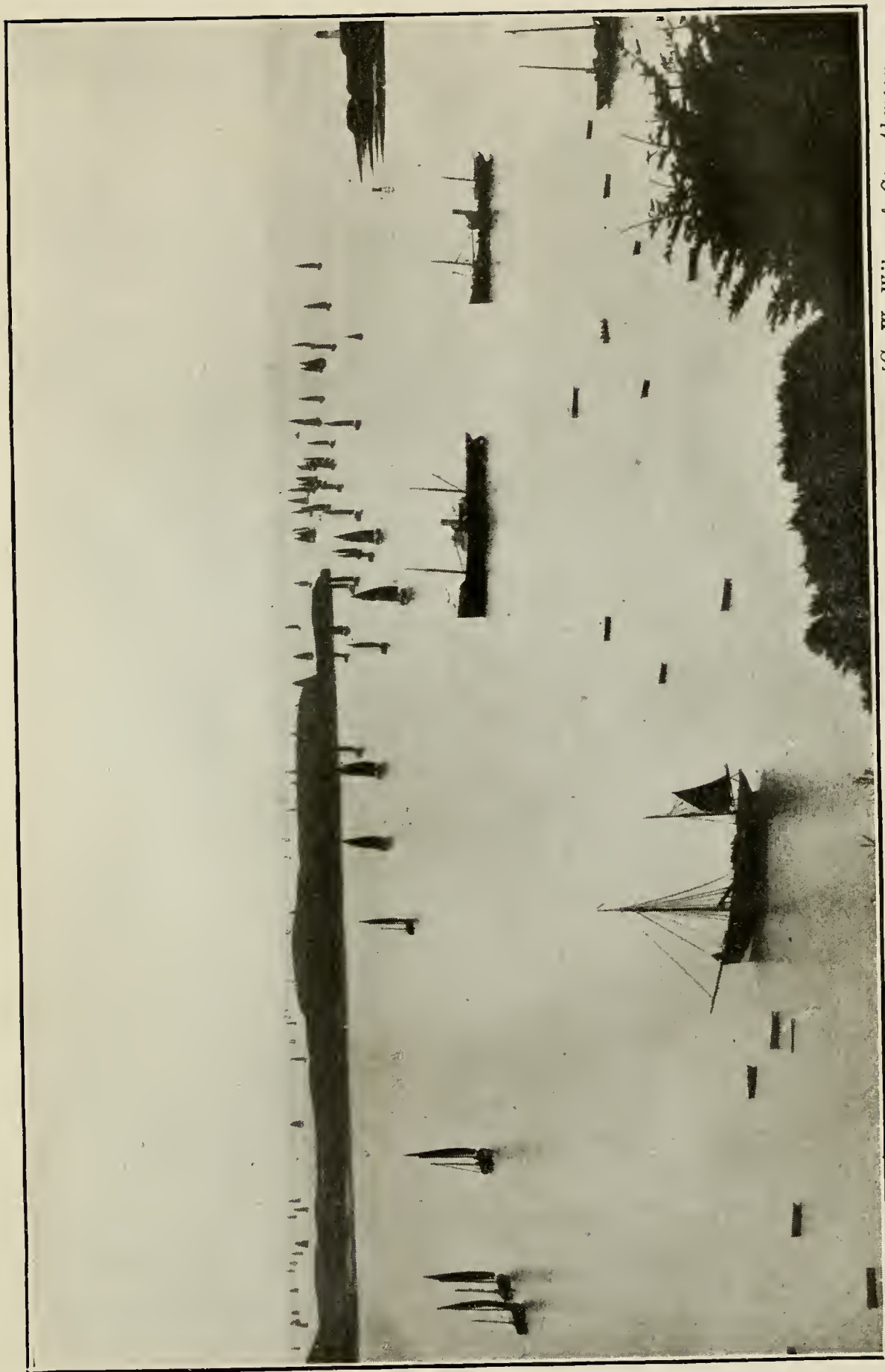
## CHAPTER IV. DIRECTION

TAKE a piece of paper. Fold it twice, crossways, so that when you unfold it there are four creases in it, going North, East, South, and West from its centre. Let us mark the ends of these creases with the letters N., E., S., and W. for the four cardinal points of the compass. The word cardinal means chief.

Now fold the paper up again, and give it one more fold in such a manner that when we unfold it, there will be a new crease running out from the centre, halfway between each pair of the creases marked N., E., S., and W. Label the new creases NE., SE., SW., and NW. These letters, of course, mean North-east, South-east, South-west, and North-west.

Once more fold the paper up along the old creases. Give the pointed bundle still another fold, and press it well down. Unfold it, and see that each space between the marked creases has a new crease. Label the eight new creases NNE., ENE., ESE., SSE., SSW., WSW., WNW., and NNW. What the letters mean we can of course see for ourselves.





[G. W. Wilson & Co., Aberdeen.

I. NORTH SEA FISHING FLEET LEAVING STORNOWAY.

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UNIVERSITY



II. NORTHERN ENGLAND, PHYSICAL.

We have now a paper marked with a star of creases, showing sixteen directions. A sailor would put a new point halfway between each of these, and so he would get his thirty-two points of the compass. The first time we get a chance we

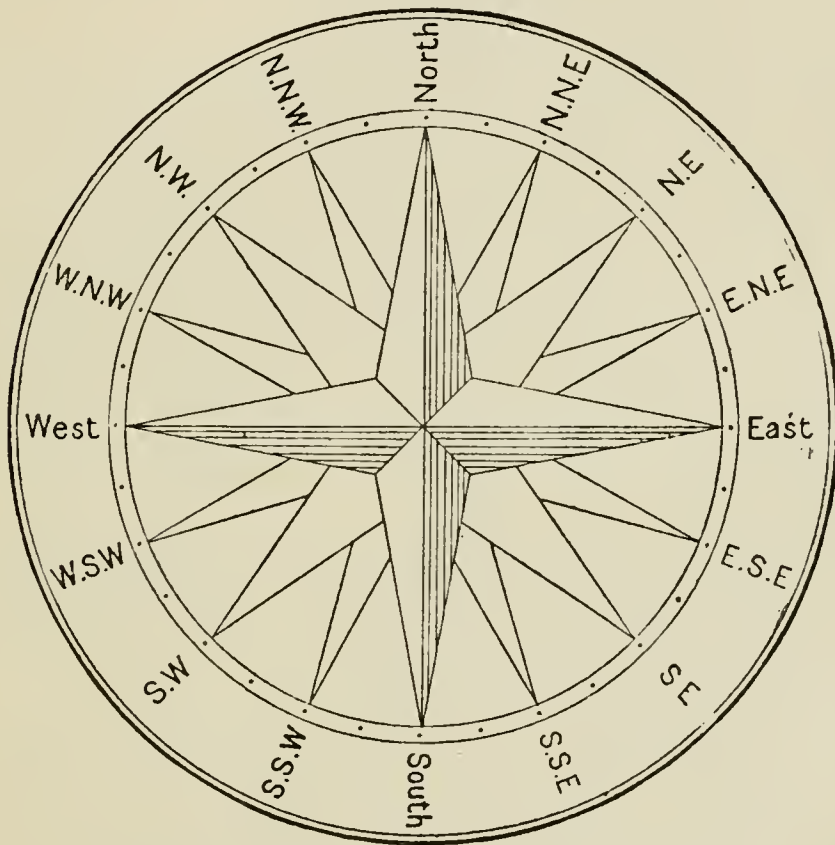


FIG. 12.—THE MARINER'S COMPASS.

will look well at a compass and see its magnetic needle always pointing North.

Let us turn to the map of the British Isles on p. 23, and let us see how we can use the paper, which we have so carefully got ready, to find out the directions of the coasts. This we shall do best by using tissue paper for our star of directions.



Then we shall be able to see the map underneath it.

Look at the Strait of Dover. Do you see the English Channel widening from it in a WSW. direction, and the North Sea widening at first gradually in a NNE. direction, until it suddenly spreads to its full breadth ?

Notice the long trend of the east coast of Great Britain in a NNW. direction, but see how the middle line of the British Isles, running in a true N. and S. direction, comes through the middle of Scotland, the Irish Sea, Wales, the Bristol Channel, the peninsula of the West of England, the mouth of the English Channel, and the French peninsula of Brittany.

All of Ireland lies to the west of this central line, and all of England lies to the east of it, except the West of England peninsula.

Let us ask our teacher to put a pencil dot on the map to mark the place of our schoolroom, and then let us find out from the map, with the help of our creased paper, the direction from our schoolroom to London.

Then we shall know how to point to London with our arms when we stand in the middle of the room. The rising and the setting of the sun will tell us which are the north, east, south, and west sides of the room.

If you live in London, there is, of course, no use



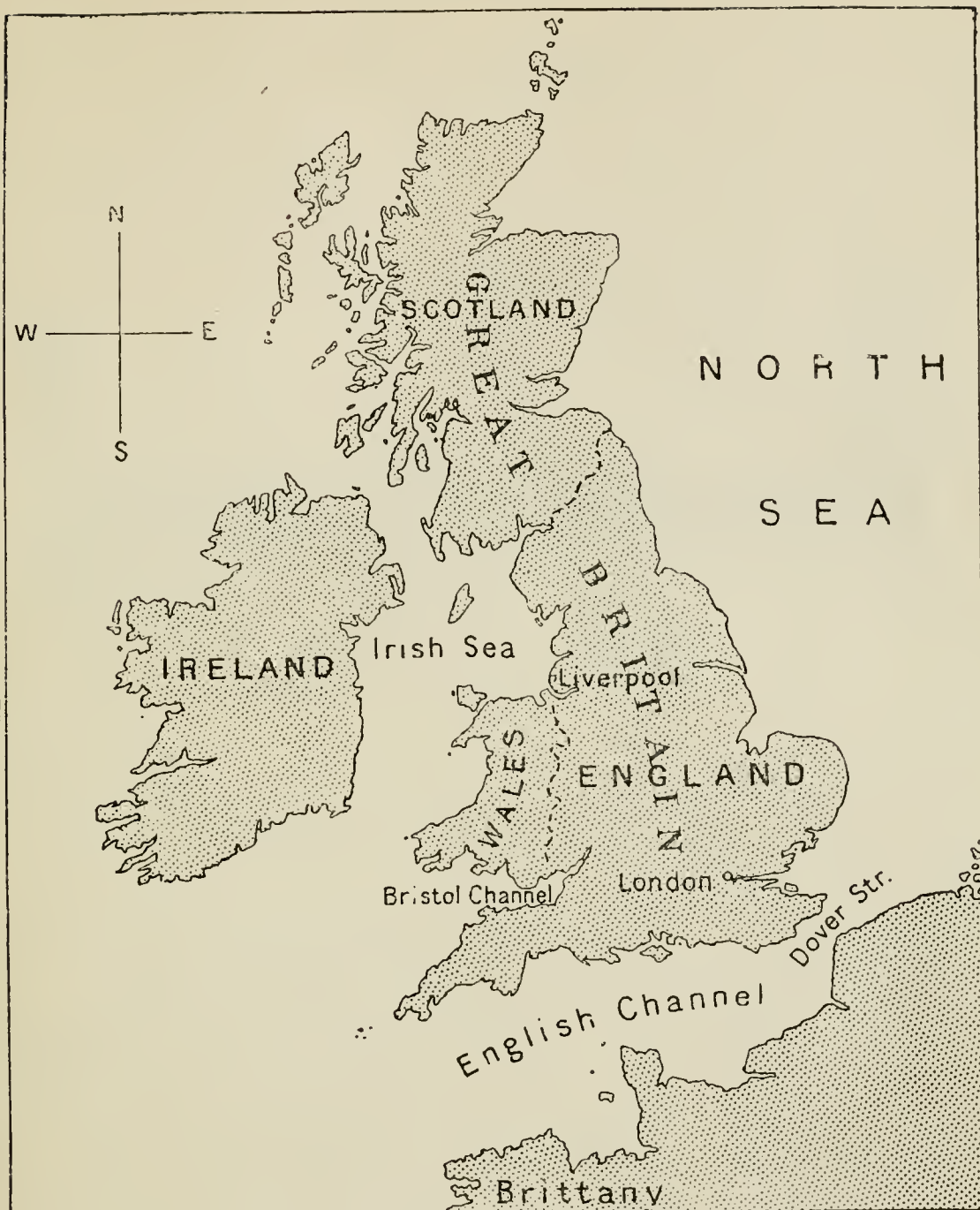


FIG. 13.—THE BRITISH ISLES.  
To show the directions of the coast.

in trying to point to it. In that case find out the direction of Liverpool, and point to it.

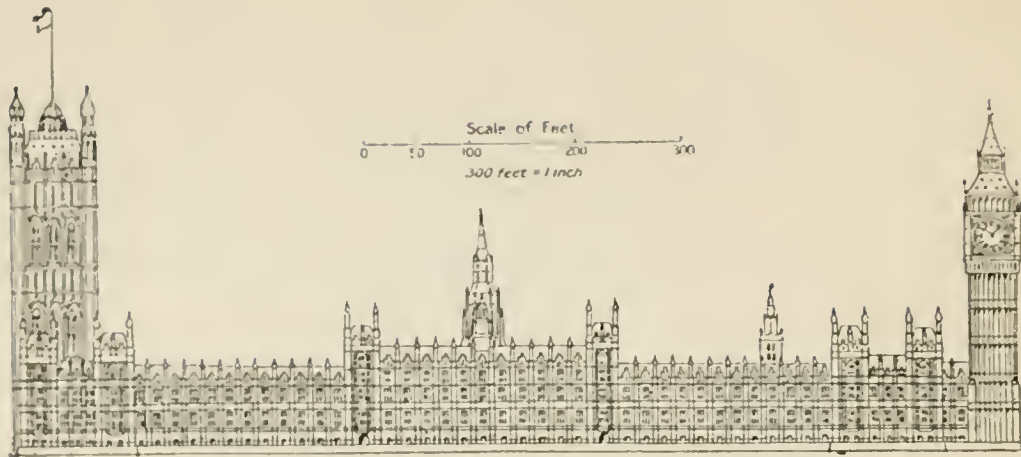


FIG. 14.—THE HOUSES OF PARLIAMENT AT WESTMINSTER.

Measure their length and height.

## CHAPTER V. DISTANCE

IN one of the great picture galleries of London there is a very pretty and very funny picture. It shows an old gentleman with spectacles on his nose standing beside the skeleton of a very large bird with a very long beak, and the old gentleman is measuring the length of the bird's beak with an inch measure. The artist has written under that picture, "Science is Measurement."

Geography is the science which tells us about places. It answers the question, "where is this or that place?" But geography has not only to tell us that Ireland lies to the west of England, and

Scotland to the NNW. of England ; it has also to tell us how far we must travel in order to go from one country to the other. We have not only to point the direction, but also to measure the distance. If you would cycle from your home to another town in the neighbourhood, you must not only know which road to take, but also how many miles you will have to travel, in order that you may be able to tell your friends when to expect you.

Now let us try to measure roughly the size of the land in which we live. Clearly we cannot do this in the same way that we would measure our schoolroom or playground, because Britain is large, and it would take us many years to travel all over it. Therefore we must find some other way.

No doubt you have before now drawn a plan of your schoolroom, perhaps even a little map of your street or road, and you know that it is possible to draw such a plan or map "to scale." We say that a map is drawn to scale when an inch upon the paper represents a foot upon the ground, or

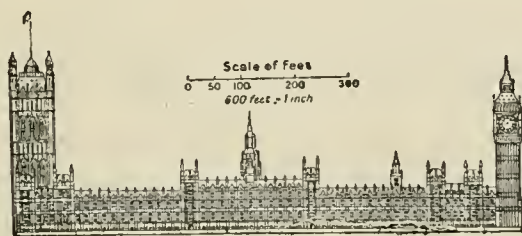


FIG. 15.—THE HOUSES OF PARLIAMENT.

How much smaller is the scale of this diagram than that of Fig 14?



perhaps half an inch on the paper represents a yard on the ground.

If you have drawn your plan correctly to any scale that you like, another person by measuring the length of a line on your paper will know the real size on the ground, for he will say to himself that every inch or half-inch on the paper represents, as the case may be, a foot or a yard or some other length on the ground.

A map is only a plan, drawn to scale, of a whole country. By the long work of many men, the British Islands have been so carefully measured, that a map of them can be drawn so that every inch of it represents, say, one hundred miles of land and sea.

Now it is clear that though you have not actually measured and never will actually measure the British Islands on the ground, yet you can find out for yourself from a map how large they are.

This is the way that you do it. In one corner of the map you will see a line marked off into spaces. This line is called the scale of miles. Take the straight edge of a piece of paper, and with your pencil mark off on the paper from the scale a distance of four hundred miles (Fig. 18, p. 29).

Lay the edge on the map in the direction of London to Edinburgh. You will see that the distance from one to the other of these cities by crow-fly—that is to say, over hill and valley in a quite



straight line—is a little less than four hundred miles. The distance is almost exactly four hundred miles by the railway, because it does not go quite straight, but winds round some of the hills.

The scale in the corner of the map is marked “statute” miles, because the mile in ordinary use has been fixed by Act of Parliament or Statute. Sailors use “nautical” miles, which are a little longer than statute miles.

Let us get our teacher to mark the position of our own town on the map in Fig. 18, and then let us spend a few minutes measuring the distances from our town to five of the largest towns in the United Kingdom—London, Manchester, Liverpool, Dublin, and Glasgow. In the next lesson we will go on with our attempt to measure the size of Britain.

## CHAPTER VI. THE SIZE OF BRITAIN

Now that we have learned how to use the scale of the map, let us try to answer the question how large is Britain? We will consider first the island of Great Britain, and first of all we must settle from what points along the coast we will take our measurements.

In the north-west of Scotland you will see on the map that the land stands out into the ocean with an angle like the corner of a room. The head of this angle is a high cliff known as Cape Wrath. We will make this the first of our points.

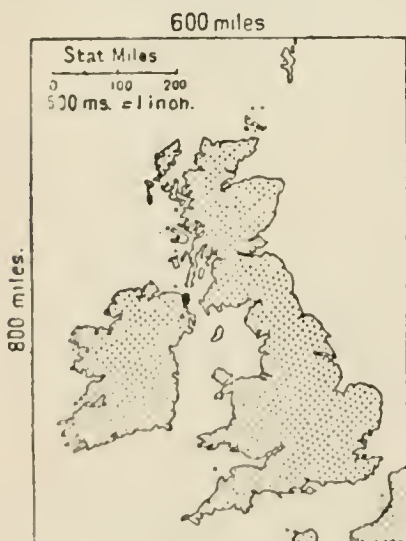


FIG. 17.—BRITISH ISLES.

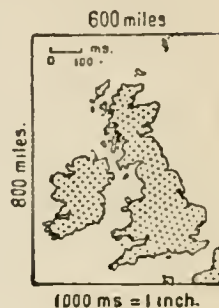


FIG. 16.—  
BRITISH ISLES (to illustrate scale).

In the south-west of England is the promontory which we have already mentioned in Chapter III as the Land's End. It stands forward from the rocky, but not very high, land of Cornwall. The Land's End will do very well for the second of the points from which to take our measurements.

The third shall be at Dover, at the corner of England which is within sight of the Continent. It is very differently placed from Cape Wrath and the Land's End, both of which stand out into the waters of the great ocean.

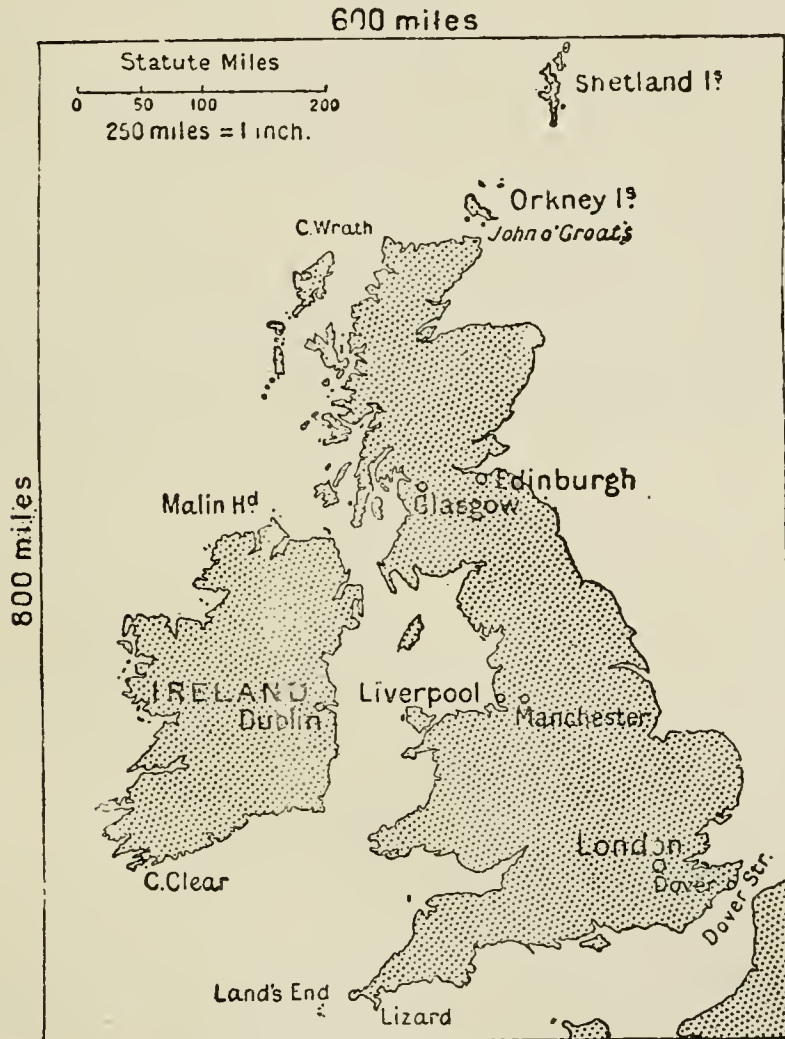


FIG. 18.—BRITISH ISLES.

Now take a paper with a straight edge to it, and mark on it a hundred miles according to the scale of the map. Measure with its help the distance in a straight line from Dover to Cape Wrath, and then





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FIG. 19.—THE LAND'S END.

from Cape Wrath to Land's End, and then from Land's End back to Dover. Set down in miles these three distances, and add them up. If you have measured them rightly, their total will be about seventeen hundred miles.

Next measure the length of Ireland from north to south, that is to say, from Malin Head to Cape Clear. The latter cape is on a little island detached from the mainland of Ireland. If you have measured rightly, you will find that the length of Ireland is less than half of the length of Great Britain from Cape Wrath to Land's End.

When we wish to talk of the whole length of the

island of Great Britain, it is very common to say “from Land’s End to John O’Groat’s,” because in the far north of Scotland, but to eastward of Cape Wrath, there was once a house which belonged to a Dutchman called John of Groat. This was the last house in Scotland in the direction of the Orkney Islands.

Let us practise a little more in the use of the scale of miles. For example, let us measure the distance from the most eastern to the most western point of the United Kingdom, and then from



*Reproduced from pen and ink drawing by permission of the Register of Dover Harbour.*

FIG. 20.—DOVER HARBOUR.

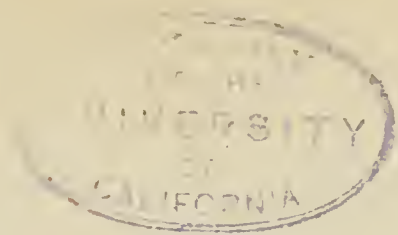
Note the castle on the cliff above the town.

the most northern point to the most southern. The most northern point is on the Shetland

Isles, and the most southern point is called the Lizard.

We ought now, with the help of a map, and its scale of miles, and a creased sheet of paper, to be able to answer any question put to us as to directions and distances. Of course the places about which we ask these questions must be shown on the map which we consult. That is why we require more than one map.





## CHAPTER VII. THE TIDES

Time and Tide stay for no man.

—ENGLISH PROVERB.

WE all know that a wind, even a little wind, raises ripples on the surface of the water. This you may see on any pond or stream, and if you live by the seaside, you know that the sea is very seldom quite calm. Sometimes when it is swept by a strong wind, the sea runs in great waves, and at such times ships are wrecked and men drowned.

But in addition to the waves caused by the wind, there are other movements in the sea which are very important for British commerce. If you go to the seaside where there is a broad sandy shore, on which the children dig, you know that the waves of the sea do not always break in the same place. Little by little they creep up the shore as the hours go by, until they reach high water mark, and then little by little again they return to low water mark. There is high water about every twelve hours. This forward and backward movement of the sea is called the tide.

In the autumn, when the seaweeds break away from their roots in the great forests of the sea-bed, there is a line of weed left by each tide all along

high water mark, and men come with carts and take the weed away for manure on the fields.

When the tide is out and the sand is left dry, men go with nets to fish for shrimps in the pools of water which remain here and there upon the shore.



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FIG. 21.—BLACKPOOL AT HIGH TIDE.

So you see that the tide behaves with great regularity. It comes in and goes out twice every day. But high tide is a little later each day, because there is a little more than twelve hours between each high water and the next. Moreover, there are large or spring tides one week, and small or neap tides the next week.

Of course there are some places where there is no

sandy shore and the great cliffs rise straight from the water's edge. A boat cannot approach such cliffs in ordinary weather, because the waves are too strong and the boat would be crushed against the rocks.



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FIG. 22.—BLACKPOOL AT LOW TIDE.

But sometimes, on very rare days when there has been no wind for some time, you can go right up to the foot of the cliffs. If you get there at low water, you will see a line a few feet up the cliff marking high water, and on the rock below this line you will see, clinging to the face of the cliff, hundreds of shell-fish, mostly limpets and barnacles, waiting patiently for the water to rise again and cover them.



Now think what must happen when the tide rises at the mouth of a river. The water must, of course, run up into the mouth of the river, just as it runs up over a gently sloping sandy shore. If you stand on a bridge spanning a tidal river and watch the water beneath, you will see that at one time of day it is running up into the land, or, as men say, the tide is flowing. At a later time, when

the tide has turned, the water runs down the river to the sea, and the tide is then said to be ebbing.

The tides run a long way up many of the British rivers. Look at the map of England in Fig. 25, p. 41, and find the Humber on the east coast. You will see that it receives two large

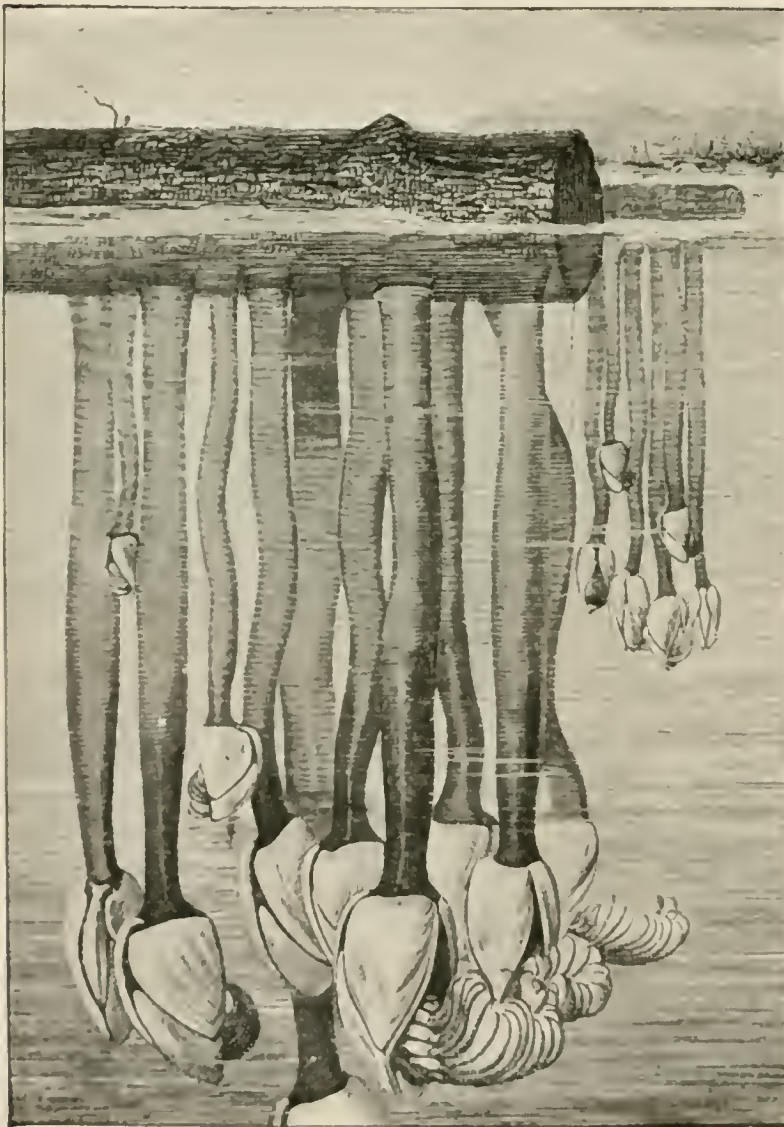


FIG. 23.—BARNACLES.

ivers, the Ouse from the North and the Trent from the South.

The tide not only runs up the Humber to its head, but it continues up the Ouse nearly to York, and up the Trent a little beyond Gainsborough. If you measure the distance from the Humber mouth to the head of the tide ways on the Ouse and the Trent, you will be surprised to learn how far inland the tide penetrates. Ships make great use of the flowing tide when going up rivers.

Look now to the south-west of England, and see the great estuary of the river Severn. The word estuary is taken from a Latin word which means tide. An estuary is, therefore, the part of a river near its mouth which is entered by the tide. In the case of the Severn the tides come nearly to Gloucester, and they go up the river Avon, which falls into the Severn estuary, as far as the great port of Bristol.

A very wonderful thing happens in the Severn at the highest or spring tides. The Severn runs strongly, because it brings much water down from the Welsh mountains. But the tide rises very high and falls very low on this part of the English coast. The result is that at spring tides the sea water, running up against the out-flowing fresh water, makes a wave which is called the Bore. You can hear the Bore coming up the river with a great noise when it is several miles away.





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FIG. 24.—A DOCK.

The water is held up within the dock by means of the closed gates in the middle of the picture.

There is a wave like the Bore, but not quite so large, in the Humber and in the Trent. It is there called the Eagre. At the time of spring tide on a fine moonlight night it is very grand to hear the Eagre coming up the river. The boatmen call to one another "'Ware Eagre," which means "Beware of the Eagre." And then you see the line of foam, four or five feet high, come round a corner in the river, white in the moonlight sheen.

The tide runs up the river Thames as far as Teddington, which is a place twenty miles higher up than London. Although there is no Bore or



Eagre in the Thames, yet the ebb and flow are very strong, and at spring tides high water is twenty feet above low water at London Bridge.

If you go to Gravesend, a place twenty miles lower down the river than London, you will often see many steamers anchored, waiting for the turn of the tide, because at low water the river above Gravesend is not deep enough for large vessels.

When the tide has turned and is flowing once more, the steamers proceed up the river and enter the docks. These are large, deep spaces of water surrounded by stone quays for the landing of goods and passengers. The ships enter the docks at high tide, and the dock gates are then closed, so that when the tide begins to fall, the water within the docks cannot flow out. Thus the ships within a dock remain floating when the water has fallen low in the river outside.

Look once again at the map of the British Islands (Fig. 25), and see how rich the British coast is in great estuaries, swept by tidal waters, which pierce into the heart of the country. Find out as you go round the coast the names of some of the largest of them.

On the east side of Scotland you have the Firth of Tay, leading up to the great port of Dundee. The word "firth" is a Scotch word meaning estuary. A little to the south you have the still larger Firth of Forth, which leads to the port of

Leith, close to Edinburgh. The rivers Tay and Forth come down into these firths.

Then some distance more to the south, on the coast of England, you see the Humber, of which we have already spoken. Hull is the chief port upon the Humber. After that comes the Wash, a broad but shallow and inconvenient entry of the sea leading to the small ports of Boston and King's Lynn. Last on the east coast is the estuary of the Thames, leading up to London, the greatest port in the world.

On the south coast we have Southampton Water and the port of Southampton. On the west coast are the Bristol Channel, with the estuaries of the Severn and Avon, and the ports of Bristol and Cardiff. Further north we have the estuaries of the rivers Dee and Mersey, with the small port of Chester and the great port of Liverpool. And last, on the west coast we have the Firth of Clyde, at the head of which is the port of Glasgow.

In Ireland we note the port of Limerick on the estuary of the Shannon, which is the longest of all British rivers.

To reach all these ports ships make use of the flowing tides. Thus we see that British commerce owes much to the tides.

In most other parts of the world there are smaller tides than in the British seas. In the open Atlantic Ocean, some distance to west of Ireland, the

difference between high and low water is only two or three feet. Here then we have a fifth reason for counting Britain a fortunate land. We will look back to the first chapter and refresh our memories as to the other four.



FIG. 25.—THE TIDAL RIVERS OF BRITAIN.  
Note the scale of nautical as well as statute miles.



## CHAPTER VIII. THE BACKBONE OF ENGLAND

IF a traveller landed at Dover, and on a bicycle or in a motor car rode north-westward through England (see Plate X, p. 100), he would traverse for more than half the breadth of the island a gently rolling country, with a few belts of low hill. Nearly everywhere he would behold a network of hedgerows.

At first, while he was passing through Kent, he would see many beautiful hop-gardens and large apple-orchards. At the end of Kent he would come to the houses of London, and for nearly twenty miles would run through the red brick streets in a smoky atmosphere. In the middle of the great city he would cross the Thames by one of the bridges, and would see the river flowing rapidly beneath him, either running up with the flood tide or down with the ebb.

When he had left London behind, he would pass through the Midlands, a land of broad fields and rich green meadows. At last as he came to Derby he would see rising before him, if the weather were clear, hills larger and bleaker than any of the lesser

heights which he had passed on his journey through the plain.

These hills mark the beginning of a land of high barren moors in the north of England and in Scotland. The moors have grey stone walls instead of verdant hedges; they have few trees, and are clothed only with grass, or moss, or heather; but here and there are beautiful landscapes with mountain peaks and tumbling streams, wooded slopes and silvery lakes, and at last, on the borders of the ocean, towering surf-beaten crags.

So you see that Great Britain consists of two parts: in the south is a low-lying, fertile country with many farms, but in the north and west much of the ground is covered with high and naked hills, fit only for the pasture of sheep, and for the wild deer. If you look at Plate X, and also at Plate II, p. 21, you will see the hills shown in brown and the lowland in green.

Before our traveller set out again from Derby to explore the North, he would probably rest a while to read his guide book and study his map, in order that he might know exactly where to go and by what roads. Let us also look at the map and help him to plan his journey.

First of all let us find the towns Derby and Stafford in Plate II, and let us draw a line from one to the other. Then let us find the towns Newcastle and Carlisle, and let us draw a line joining these

two places. Most of the country which lies northward of Derby and Stafford, as far as the line connecting Newcastle and Carlisle, consists of broad high moors.

By using the scale of miles, you can measure upon the map the length, northward and southward, of this belt of high country, which is known as the Pennine Moors, or often as the Pennine Chain.

The great cities of Sheffield and Manchester stand the one at the eastern edge and the other at the western edge of the moors. You can, therefore, easily measure the breadth of the Pennine Chain.

The highest part of the Pennines is at Cross Fell, near the point where the counties of Cumberland, Westmorland, and Durham meet. But even the top of Cross Fell is less than 3,000 feet above the sea-level, or only about half a mile high.

It is very useful to remember that a mile contains rather more than 5,000 feet, so that if you hear that a mountain measures 5,000 or 10,000 feet you can at once turn its height into miles.

All hill heights are measured from the sea level. You know how flat and level the water stands in a glass or in a pond. It is the same with the sea. Even the largest waves do not interfere with the general level of the vast ocean. You hardly notice them when you look down on the blue water from a high cliff.



Let us now try to picture to ourselves the shape of the whole Pennine Chain. We have learnt, by measuring upon the map, that the moors are several times longer than they are broad, and if you remember the height of Cross Fell, you will know that they are many times broader than they are high.

The Pennine Chain is, in fact, like a great uneven slab of stone lying along the centre of the north of England. When a thing stands up in this flattened way, like the King's head on a penny, we speak of it as being in "low relief" or in "bas relief," from the French word "bas" which means low.

On the top of the Pennine Chain you can walk in the brisk upper air for miles and miles over the purple heather of the great rolling moors (Plate III, p. 52). When at last you come to the edge of the high ground, you look down on to the broad fields of corn and grass which spread over the lowland beneath.

If you live in a hilly country, you must often have seen that the snow rests on the hill tops long after the thaw is complete on the lower ground. Corn and most other crops will not grow in England at heights much greater than a thousand feet above the sea, because even in summer the air is cool above that height.

Therefore it is that all the moorland tops of the



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FIG. 26.—IN THE CHEVIOT HILLS.

The cattle are grazing below, while the snow still lies on the hill tops above.

Pennine Chain are covered merely with short mountain grass, or heather, or peat moss. But this poor herbage serves to support on the heights great numbers of sheep.

I think you will now see why we describe the Pennine Chain as the Backbone of England. It rises along the centre of the north of England like the bony ridge in the middle of your back.

## CHAPTER IX. THE RIVERS OF THE NORTH OF ENGLAND

THERE is more rain on the hill tops than on the plains below them. In a hilly country the summits are often hidden in cloud when there is bright sunshine a short distance away. To carry off the abundance of water, the Pennine Hills send down into the lower country a great number of rapid streams.

These begin near the centre of the moorland and run through it in narrow valleys, which at last become so deep, and have such high steep sides, that they are spoken of as "Dales."

Look at Plate II, p. 21, and see how the rivers come out of the Pennine Hills, and flow across the plains either eastward into the North Sea, or westward into the Irish Sea. You know the high moors and the low plains by the brown and the green on the map.

Starting in the north on the eastern side, we have three rivers, the Tyne, the Wear, and the Tees, which run with comparatively short courses direct to the North Sea.

Then we have a number of others, the Swale, Ure, Nidd, Wharfe, Aire, Calder, and Don, which do not go direct to the sea, but when they have





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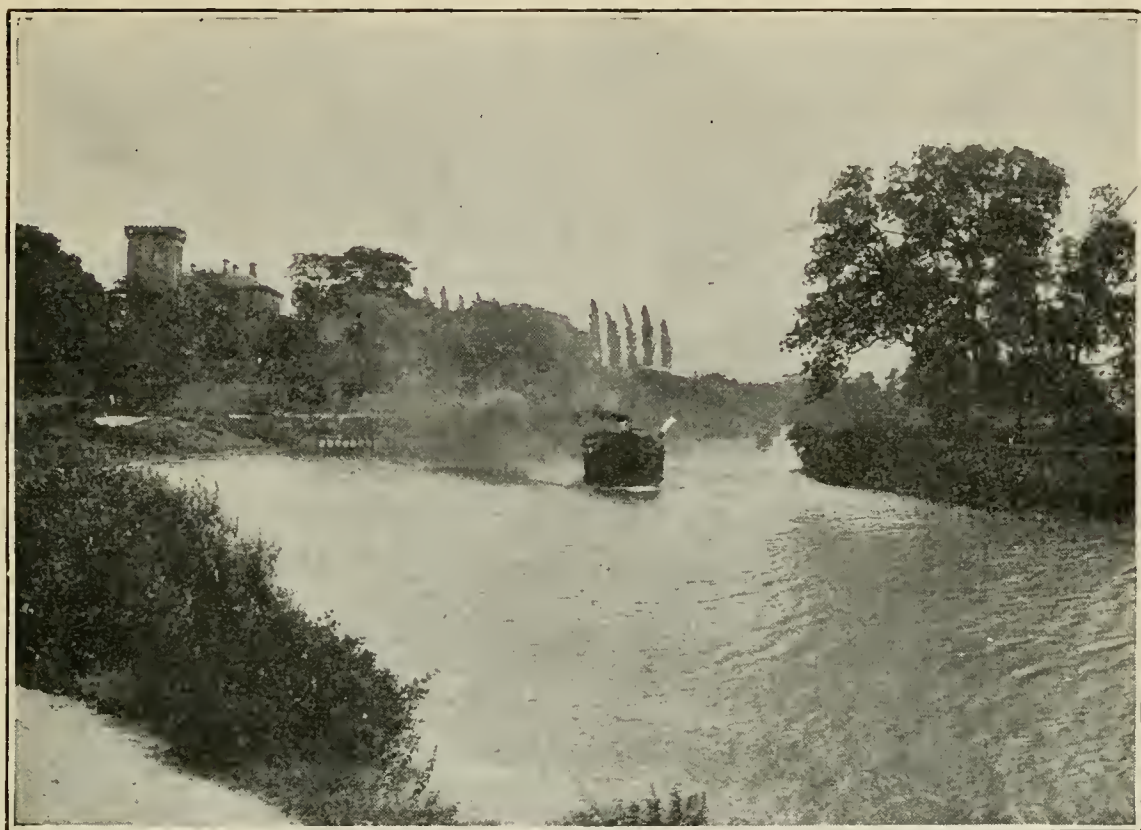
*[Photochrom Co., Ltd.*

FIG. 27.—CALDRON SNOUT, A FALL ON THE TEES.

This shows the first part of a river, the torrent in the hills, near the source.

come out of the dales, and are clear of the edge of the moors, they join together to make a large river, which is called the Ouse. This river, as you see on the map, flows southward in the low plain known as the Vale of York, because the ancient city of York is in the centre of it.

When looking at the map it would be well now to note the exact meaning of the brown and the green. The meaning of the one is that the country is more than 600 feet high, and of the other that it is less. Let us enquire and write down how high above the sea is our schoolroom.



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FIG. 28.—THE OUSE AT CLIFTON, NEAR YORK.

This shows the third part of the river, the tranquil, navigable water in the lowland plain. For the second part see Plate V, p. 68.

The Ouse has a broad, slow current, because it flows through the low plain, whereas the streams which come down to it from the Pennine Chain fall rapidly through the dales, splashing and laughing over the rocks. Therefore the Ouse itself is navigable for barges and other small ships, whereas the streams which join it from the dales are not navigable. On the other hand they can be used to turn mills for grinding flour, or, as at Sheffield, for grinding knives to a sharp edge.

The streams which thus contribute water to a



main river are described as its tributaries. (See Fig. 27, p. 48, Plate V, p. 68, and Fig. 28, p. 49.)

Look once more at Plate II. The southern part of the Pennine Chain is called the Peak of Derbyshire. Here you will find some more streams, descending from the high ground through narrow valleys into the plain of the Midlands, where they are gathered up by another large sluggish river called the Trent. The chief tributaries to the Trent from the Peak are the Dove and the Derwent.

The Trent, as you observe, flows right round the south end of the Pennine Chain and then northward until it meets the Ouse coming southward. The two rivers together make the great estuary of the Humber, which flows eastward and at last opens to the North Sea.

You will remember that the word "estuary" means the tidal mouth of a river, and you will remember also, from Chapter VII, that the tide runs up the Humber to its head, and then for some distance northward up the Ouse and southward up the Trent. The tide thus meets the water flowing down from the Pennine heights, but of course only when the tide is rising.

All the water which is carried out to the sea by the Humber falls upon the land as rain. Upon Plate II you can see that a line might be drawn round the sources of all the tributaries which flow into the Ouse and the Trent. A great space



would thus be enclosed which would be described as the Basin of the Humber. Within this basin the rain water is everywhere flowing gradually down and gathering into the Humber mouth.

The Vale of York lies between the Pennine Moors to the west and a belt of hilly ground to the east, which is not so high as the Pennine Chain. The Humber on its way to the sea goes by a gap right through these eastern hills, thus dividing them into two parts, the Yorkshire Wolds to the north and the Lincolnshire Wolds to the south.

In Plates II and X, p. 100, you see that only a small part of the Yorkshire Wolds and none of the Lincolnshire Wolds are coloured brown, so that you know at once that in most parts they are less than 600 feet high.

Once more turn to Plate II, but this time look at the country west of the Pennine Chain. Here you will see three rivers, the Mersey, the Ribble, and the Lune, flowing out from their dales and across the narrow coastal plain of Lancashire. It is called a coastal plain because it extends along the coast and is not divided from the sea by hills, as is the Vale of York.

A line could be drawn northward on the map through the Pennine Chain, in such a way as to divide the heads of the streams going to the North Sea from those going to the Irish Sea. This line would be the Pennine Divide, or water parting,

for it divides or parts the rain water which flows through opposite dales to two different seas.

If two drops of rain fall only a foot apart beside this Divide, the one may be carried by the Aire or the Don into the Ouse and the Humber, and so into the North Sea, while the other may run by the Mersey or the Ribble into the Irish Sea.

Of course you have noticed that the line upon the map which would mark the Pennine Divide is the

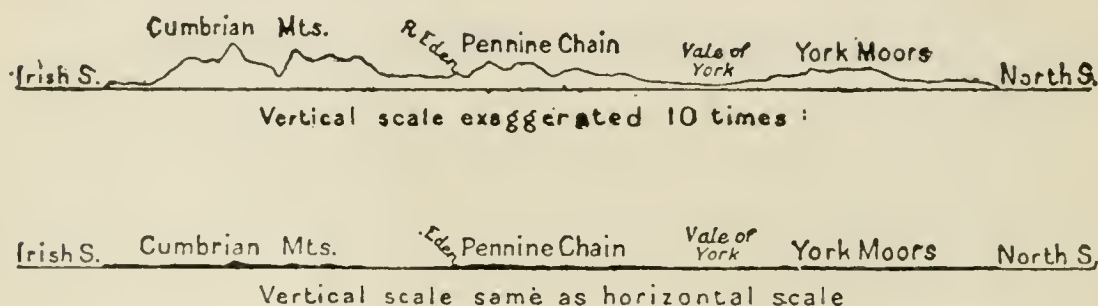


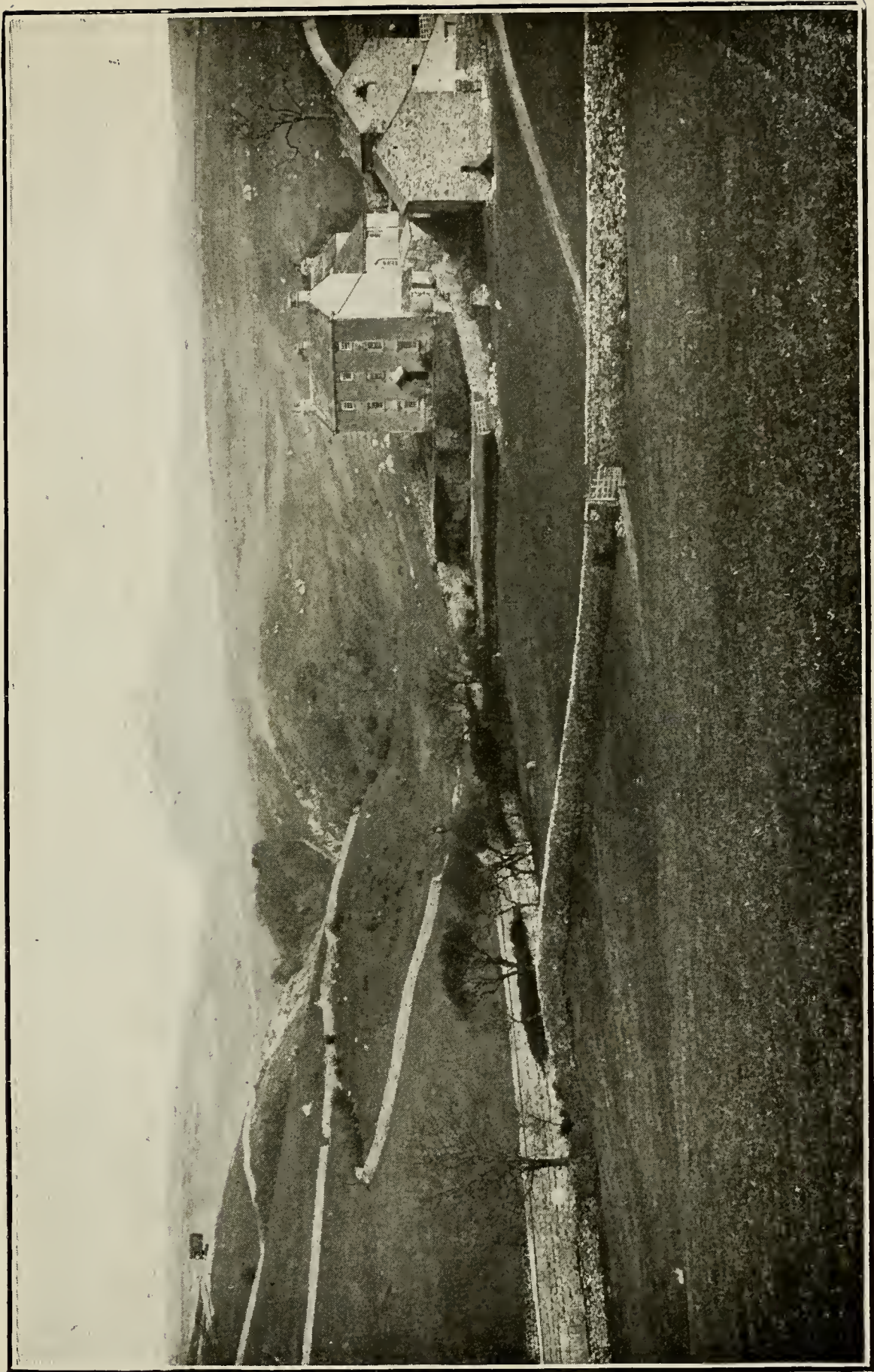
FIG. 29.—SECTION ACROSS THE NORTH OF ENGLAND.

On Plate II, p. 21, indicate the line along which these sections have been drawn.

same as that which we drew just now to enclose the west side of the Humber Basin. The Pennine Divide therefore parts the basin of the Humber on the one side from the basins of the Mersey, Ribble, and Lune on the other side.

Let us examine carefully the vertical sections shown in Fig. 29. The word vertical means upright, whereas a plan or map is horizontal or level like the horizon. The word section means a cut as though with a knife.



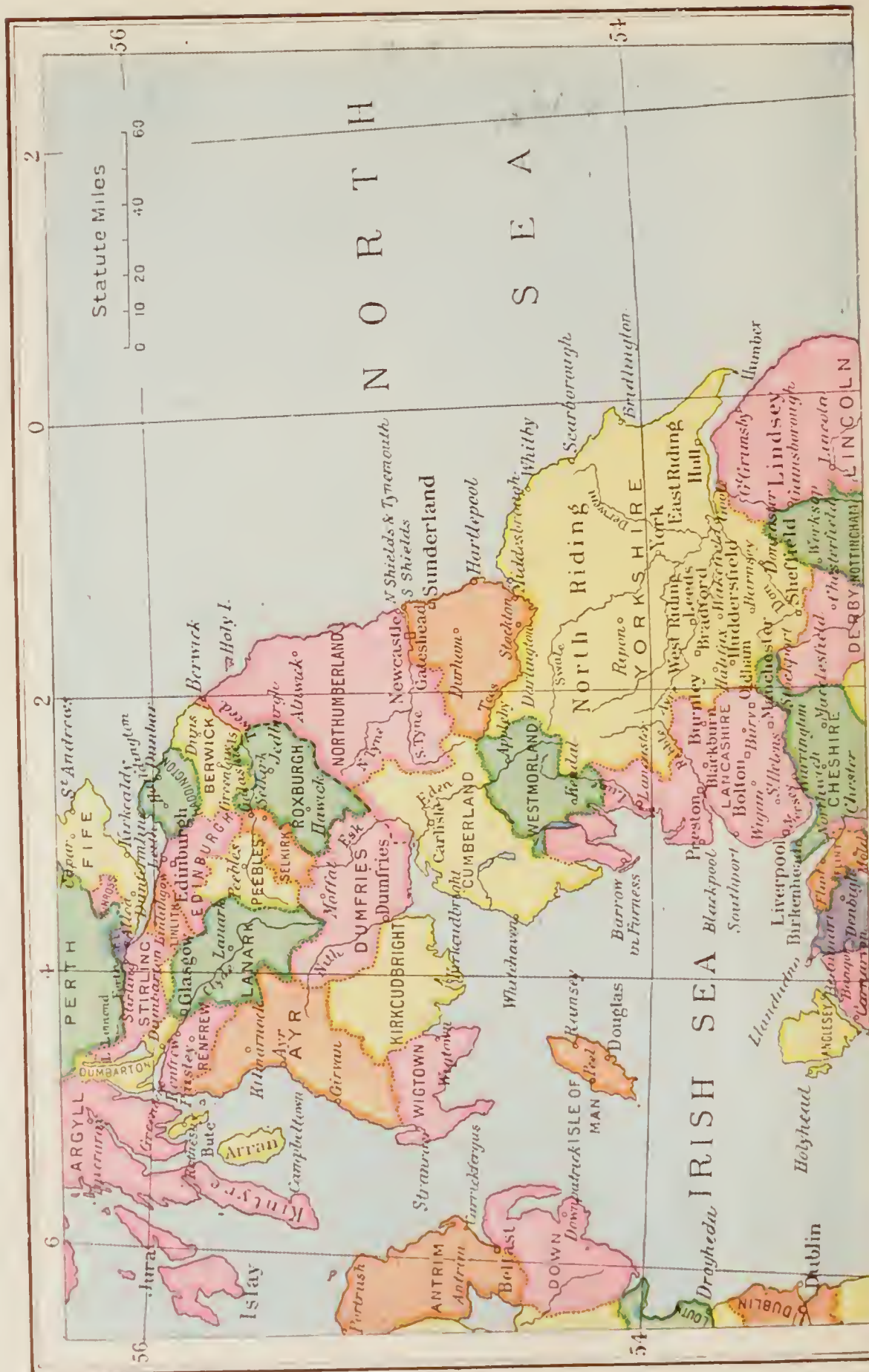


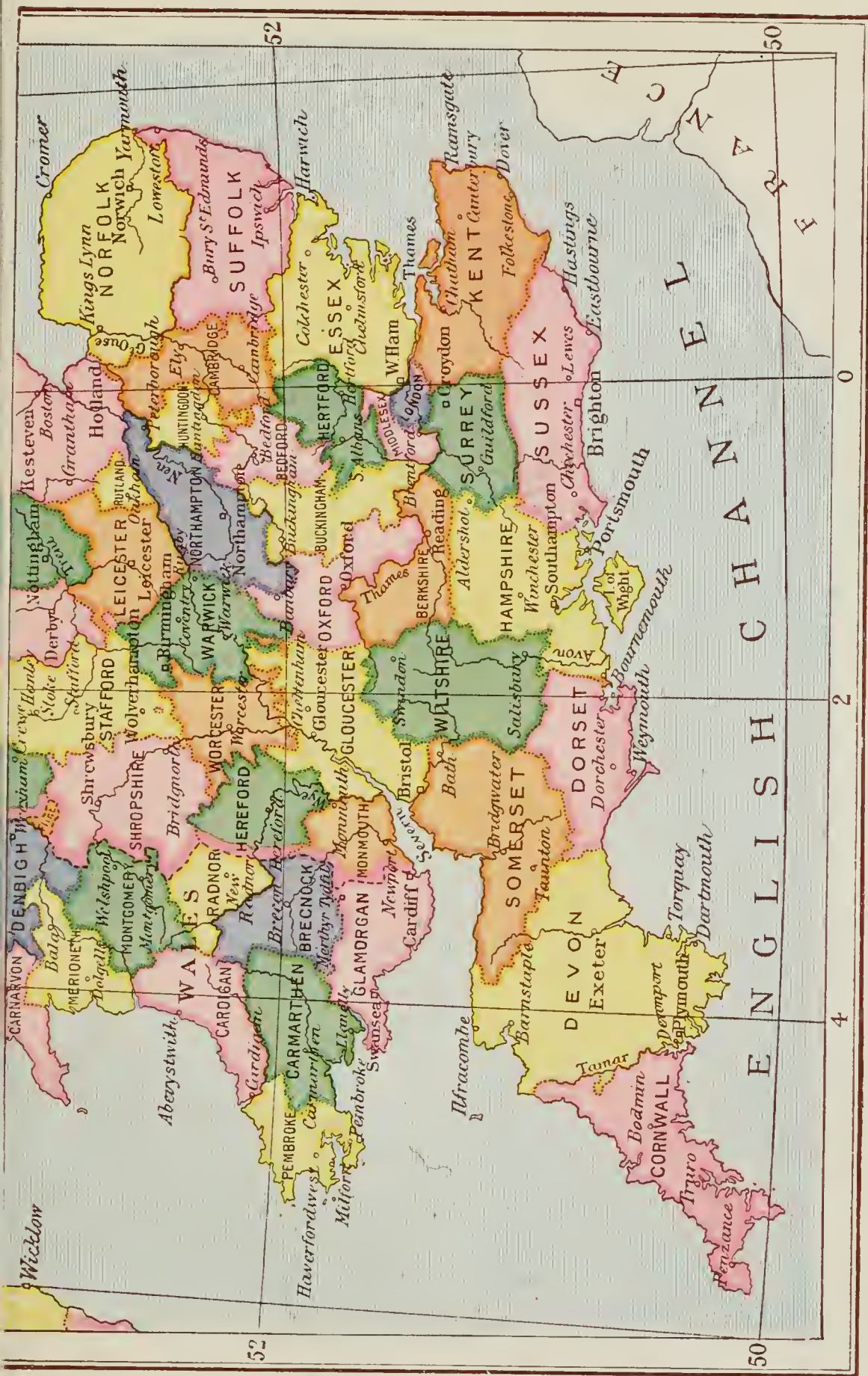
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III. A MOOR, WITH INGLEBOROUGH IN THE DISTANCE.

*[Valentine & Sons, Ltd.]*







IV. ENGLAND, POLITICAL.





[Photochrom Co., Ltd.]

IVa. LINCOLN CATHEDRAL.

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FIG. 30.—YORK MINSTER.

## CHAPTER X. THE COUNTIES OF THE NORTH OF ENGLAND

IF you have read the last two chapters carefully, I think you will agree that we must not advise our friend, who landed at Dover and is now resting at Derby, to continue his journey to Scotland along the centre of England. If he did so he would have to traverse the whole length of the Pennine Chain, crossing the bleak moorlands by roads that are bad because of the long winter frosts.

Therefore we will suggest to him that he should

go northward through the Vale of York, thus keeping on the low, level ground to the east of the Pennines. He might also go by the plain of Lancashire to the west of the Pennines.

These two ways, the one past York and along the sea coast of Durham and Northumberland, and the other through Lancashire, are known as the East Coast route and West Coast route to Scotland.

Of course, the traveller will have to take his bicycle or motor car across the rivers which flow out of the dales, and he will therefore have to find from his map where are the bridges. One of the most important of these bridges is that over the Tyne at Newcastle. That name was given, when it was new, to the castle built long ago by the Normans to protect the bridge.

Until within the last two centuries very few people lived in the Pennine dales, and even to-day there are very few on the higher parts of the moors. The ancient towns, like York, were built on the low, fertile ground, because many farmers lived there who came into the towns to do business in the markets. York, as we have seen in Chapter VII, was also a port which could be reached by small ships from the North Sea. Being therefore both a market town and a port, York was a rich place, and our ancestors were able to build for it a splendid cathedral, which you should go and see if ever you are there.

If we look at the map of England as divided into counties, we cannot fail to note that the counties of the north are grouped round the Pennine Chain. There are nine of them—Northumberland, Durham, Yorkshire, Derbyshire, Staffordshire, Cheshire, Lancashire, Westmorland, and Cumberland. From Staffordshire northward the boundary between them follows roughly, though not exactly, the Pennine Divide. This you may see by comparing Plate IV, p. 52, with Plate II, p. 21. Let us ask ourselves the reason of this.

I think we shall find the answer in what follows. In olden days the important towns were placed, as we saw just now in the case of York, among the farms of the plains and on the navigable rivers. The villages also were numerous in the fertile lowlands east, and south, and west of the Pennine Range.

But the moors, and even the dales, had very few houses. It was difficult, and at times even perilous, to cross the hills from the east to the west of the country. The hills are steep, and the roads over them very bad. In the winter time the snow on the heights lies deep and is swept by bitter winds.

It is hard for us to realize to-day how toilsome was once the journey across the north of England, because we are now carried comfortably under the moors through railway tunnels. The train



winds up a dale until it becomes too steep near its head, then plunges into a tunnel under the Divide, and emerges in the head of a dale on the other slope.

All the nine county towns round the Pennines—Newcastle, Durham, York, Derby, Stafford, Chester, Lancaster, Appleby, and Carlisle—are situated on ground low enough to be coloured green on Plate II.

Five of the Pennine counties are named after their



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FIG. 31.—ASHWOOD DALE.

A stream, a road, and a railway, side by side thread this dale, and many others.

chief towns, with the addition of the syllable shire. This was originally the same word as “share.” You



*From Photograph]*

*[supplied by Midland Railway.*

FIG. 32.—COWBURN TUNNEL, ON THE MIDLAND RAILWAY.

have it again in the verb to “shear” sheep. So you learn that the low country round the hills was divided for purposes of government between the authorities in nine towns. Each of them took its share or shire of it.

Of course the people in the dales could very easily go down dale to the plain, though in all other directions they were pent in by high hills. Therefore the counties of the plain quite naturally extend up the dales to their heads, and the county boundaries are at or near the Divide of the drainage on the Pennine Moors.

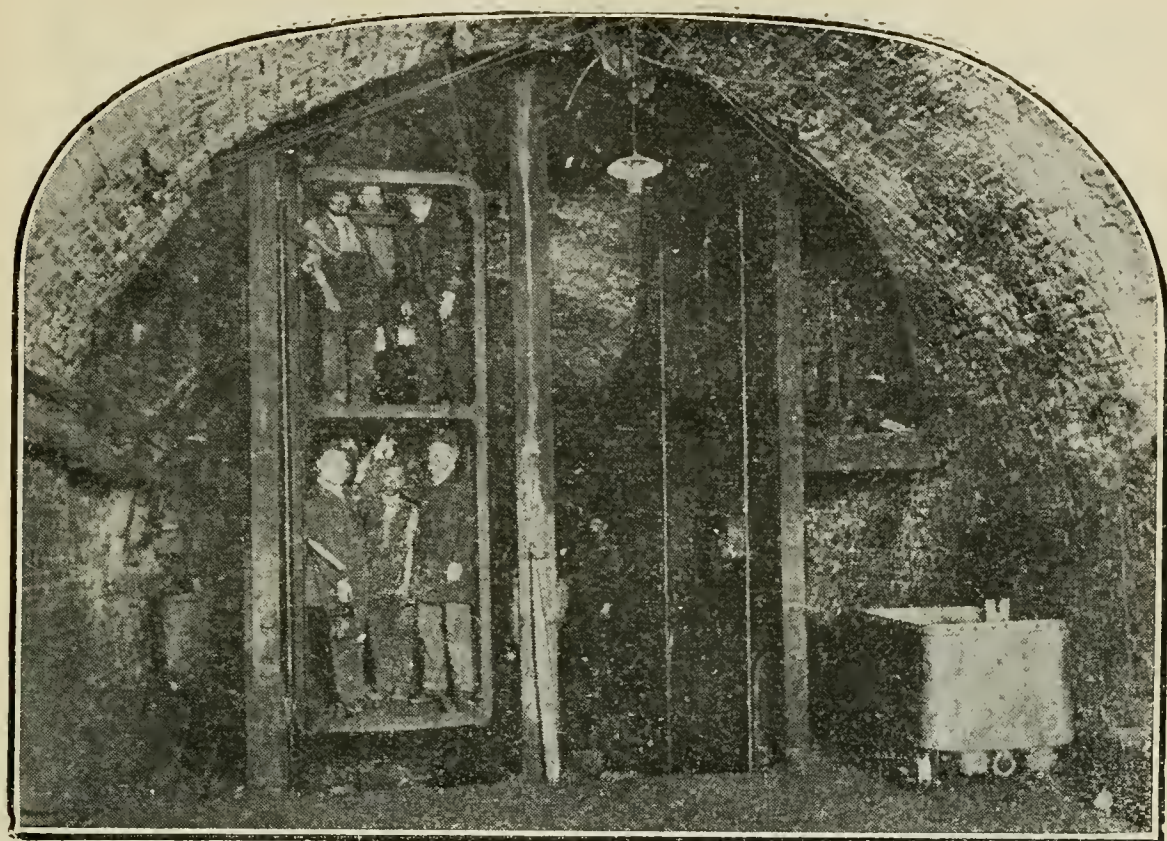


Thus we answer the question which we put just now as to the reason why the counties of the North of England are grouped round the Pennine Chain.

There is, however, one dale which belongs to Yorkshire, though it is on the west slope of the Pennines. You will easily find it on the map, for it is the dale of the Ribble, one of the three rivers flowing across the Lancashire plain into the Irish Sea. If we look at Plate II, we shall learn how it was possible, even in the old days, to rule the people of Ribblesdale from York.

Do you see the strip of green, which follows the river Aire and then goes right across the Pennines to the Ribble? This of course means that there is here a gap through the moors which is less than 600 feet above the sea. The Aire gap, as it is called, divides the Pennine Chain into the North Pennine Moors and the South Pennine Moors. At all times an easy road has led through this gap from the Ribble to York.





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*[H. W. Hughes.*

FIG. 33.—COAL MINING.

The cage in the shaft by which the colliers go down to their work.

## CHAPTER XI. THE INDUSTRIES OF THE NORTH OF ENGLAND

IN the last two hundred years a great change has come over all except the highest and most central parts of the Pennine Range. The rich beds of coal in the edges of the range, both along its eastern and its western border, were not worked in the old time.

Since the invention of the steam engine, however, coal has given rise to vast industries both in York-



shire and Lancashire. Therefore great towns have been built in the dales and on the lower moors, where once there were only rare cottages and a few sheep. Most of the change has happened since the days when our great-great-grandfathers were boys.

Let us find, in Fig. 37, p. 65, and also in Plate II, p. 21, where some of these young but very large towns are situated. We shall see that Leeds and Sheffield are placed just where the dales of the Aire and the Don open to the Vale of York. Bradford,



*(By permission of the Geological Photographs Committee of the British Association.)*

FIG. 34.

Most coal seams are deep down in the ground, but here is one on the surface near Glasgow. Note the tree-stumps, made of coal, which have been exposed by digging away the rest of the seam. Some of the coal still remains in place to the left hand. Every seam or bed of coal was, long ages ago, a forest.

Halifax, and Huddersfield, on the other hand, are higher up the dales, and are therefore surrounded by steep hills leading on to the moors.

On the western side, in Lancashire, we have Manchester, Bolton, Oldham, and Blackburn, all of them either in the dales, or near where the dales open to the plain of Lancashire.

The industries supported by the coalfields along the flanks of the Pennine Range are the spinning and weaving of wool and cotton, and the manufacture of iron and steel.

The woollen trade is chiefly in the West Riding, or division, of Yorkshire. This county, because it is the largest in England, is divided into three Ridings—North, East, and West. The Pennine Range is mainly in the West Riding, and the woollen trade sprang up there because there was wool to be had from the sheep on the moors, and because the water in the dales was very pure and suitable for washing the wool.

But now that coal is used to drive the machinery, and that the trade has grown enormously, the Pennine wool is not nearly enough to supply the looms of the district. Raw wool has therefore to be imported from our colonies in Australia.

Cotton is manufactured round Manchester, on the Lancashire coalfield, to west of the Pennines. It is manufactured there partly because much of the raw cotton comes across the Atlantic from



America, and is therefore most easily brought in by the western port of Liverpool.

But there is also another reason, which is that a moist atmosphere is needed for the spinning of the better kinds of cotton, because the cotton fibre



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London and New York.*

FIG. 35.—A COTTON FIELD IN AMERICA.

becomes brittle and breaks when the air of the mill is too dry. Now the winds from the Atlantic bring much moisture to the western side of the Pennine Hills, but the eastern side is, of course, sheltered from

the moist west winds.

The east winds, as you know, are usually dry in England, because they blow from the great continent of Europe and Asia, and have to cross only the comparatively narrow North Sea, instead of coming as the west winds do off the great ocean.



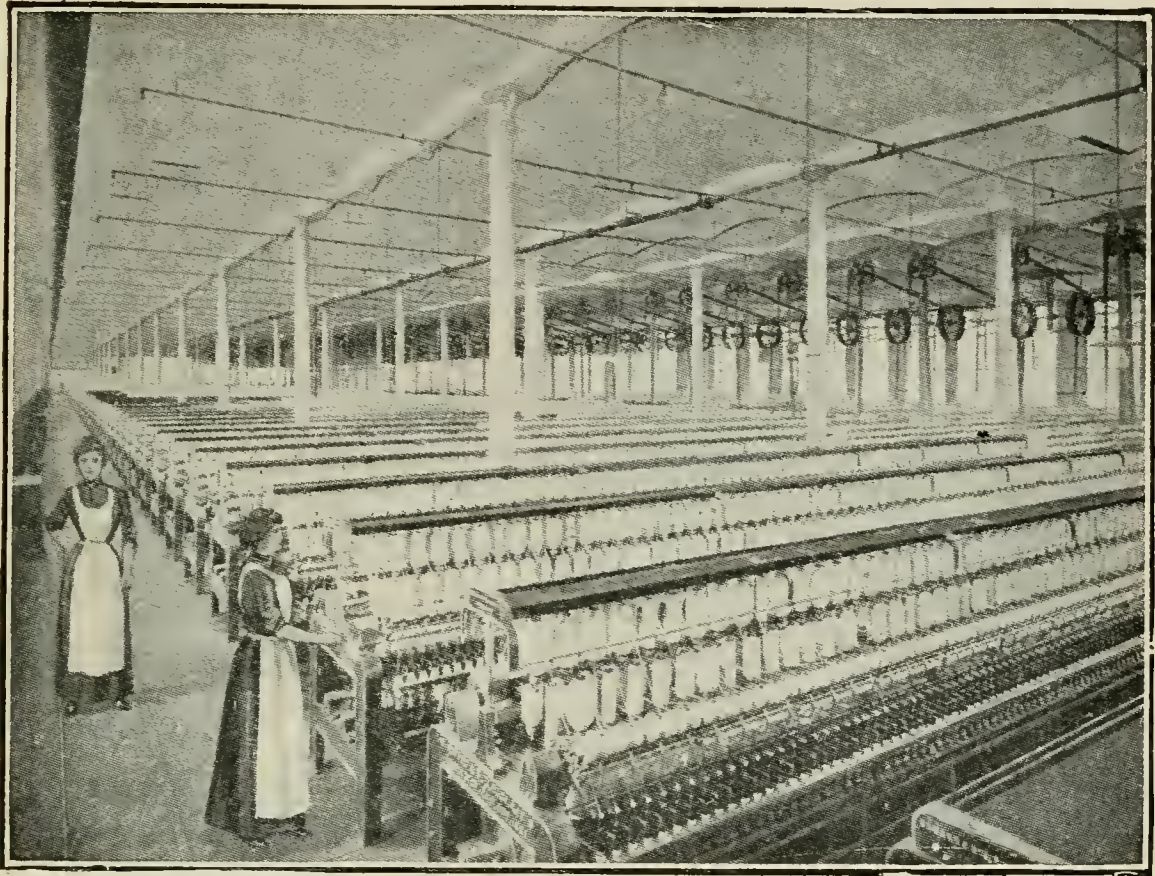


FIG. 36.—A COTTON MILL IN LANCASHIRE.

Sheffield, and the towns near it, are placed on the eastern coalfield, but farther south than the woollen district. They owe their importance partly to the gritty sandstone of which much of the Pennine Range consists. Near Sheffield this stone is of a kind very suitable for the grinding of knife edges. The rapid streams of the Pennine dales serve to turn the millstones on which the knives are ground.

But the chief cause of the growth of the cutlery or knife trade of Sheffield is that a century ago, when Englishmen had not learned as yet how to make good steel from the iron ores of their own

island, Sheffield was well placed to receive the very pure iron, suitable for making steel, which was then only to be got from Sweden across the North Sea. It was brought, in the days before railways, up the river Don from the port of Hull. Even now much iron-ore comes to England from Sweden as well as from Spain.

Thus it has happened that while the central and highest parts of the Pennine Range are still so empty of people, that you may walk sometimes for a whole day and meet no single person, yet all round the edges of the range, in the lower parts of the dales and on the hill shoulders which overlook the plain, a very dense population has been established. Here there are large towns and hundreds of tall, smoky chimneys belonging to the factories and to the collieries.

Along the coasts great ports have arisen whose docks are crowded with ships. Busy railways cross the pleasant farming country, carrying the traffic to and fro between the industrial towns on the coalfields and the shipping on the coast. The chief ports of the north of England are Liverpool on the west, and Hull, Middlesbrough, Sunderland, and Newcastle on the east coast. All these ports, you will observe, are on the estuaries of rivers.

There are other large towns beside the sea which have recently sprung up, not for commerce, but for the purposes of pleasure. These are the places



where the people who live near the smoky chimneys of the industrial districts like to spend their holidays. The largest of them are Scarborough



FIG. 37.—THE COALFIELDS OF THE NORTH OF ENGLAND.

You should compare this map with Plate II, p. 21.

on the east coast, and Blackpool and Southport on the west.

Let us now look at Plates II, p. 21, and X, p. 100,

once more, and try to make a picture in our minds of the whole district which is known as the North of England.

See how the Irish Sea invades the breadth of the island, taking a great square out of it and reducing England in this part to an isthmus. And see how the Pennine Range runs northward through this isthmus, making a backbone for the land. Think of the high lonely belt of the central moorland ; think of the busy, smoky districts on either hand, placed along the two edges of the moorland ; think next of the green and cultivated lowlands through which run northward the eastern and western roads to Scotland ; and then think lastly of the two sea shores, the eastern and the western, and of their ports and their pleasure towns.

What does not Britain owe to the coal buried in her rocks, and to the seas which carry her trade ?

## CHAPTER XII. THE CUMBRIAN LAKES

HAVING learnt about the manufacturing districts of Lancashire and Yorkshire, our traveller now spends a day or two running northward on his motor car to Newcastle. As he is a sensible man who wishes to see something of the country, and not merely to rush through it at the highest speed, he determines to stop a while at Newcastle.

Here we will advise him to make an excursion on foot, and to climb, for the sake of the view, the great hill at the northern end of the Pennine Chain which is called Cross Fell.

This hill is a mass of limestone, rising, as we have already learnt, to a height of nearly three thousand feet. From its summit in fine weather both the North and the Irish seas are visible as bright lines along the eastern and western horizons. The snows of winter remain long upon the crest of Cross Fell, and in some years have been seen there throughout the summer.

Three rivers, the Tees, the Wear, and the southern head-stream of the Tyne, rise in the moors



which slope gradually eastward from Cross Fell.

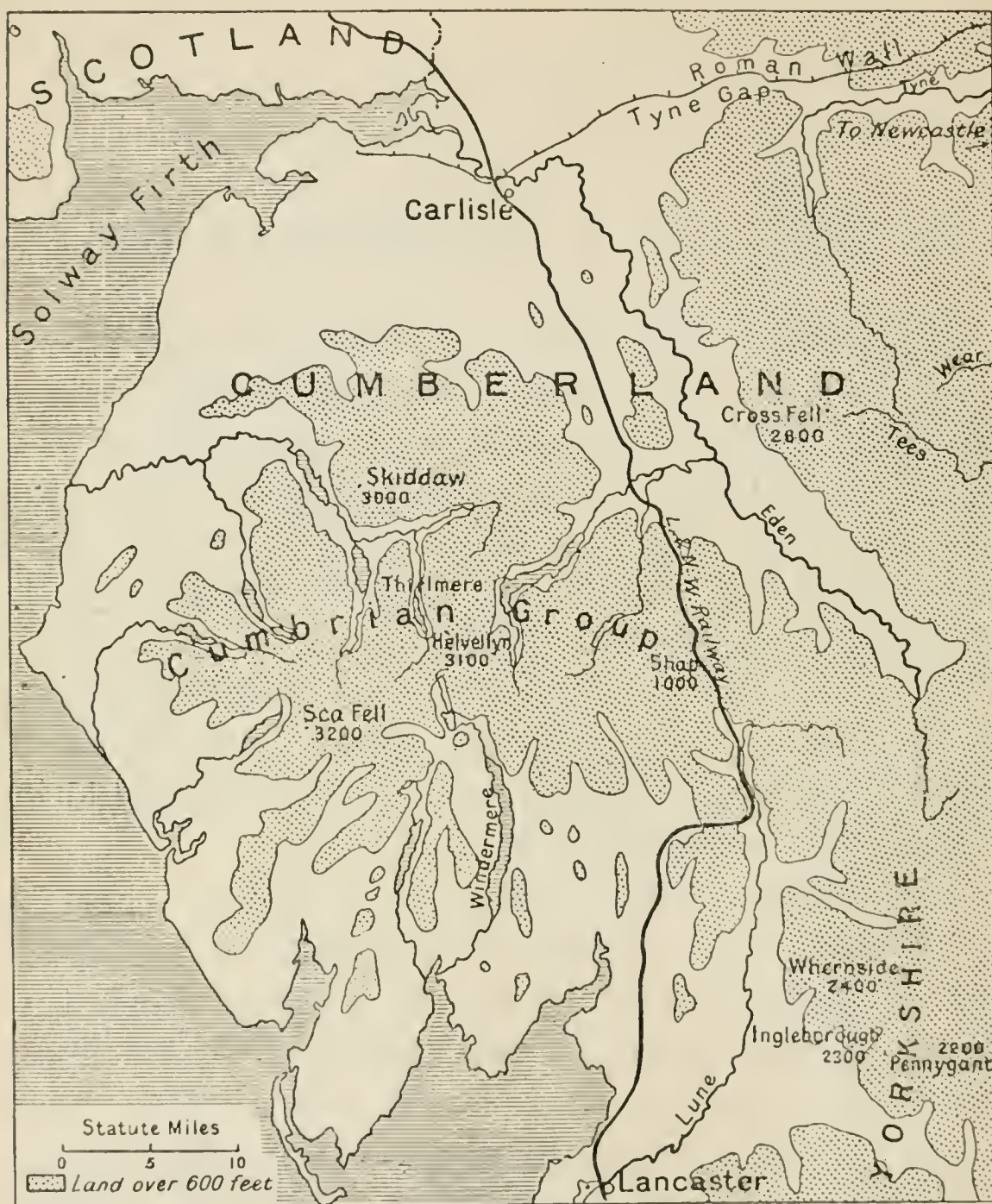
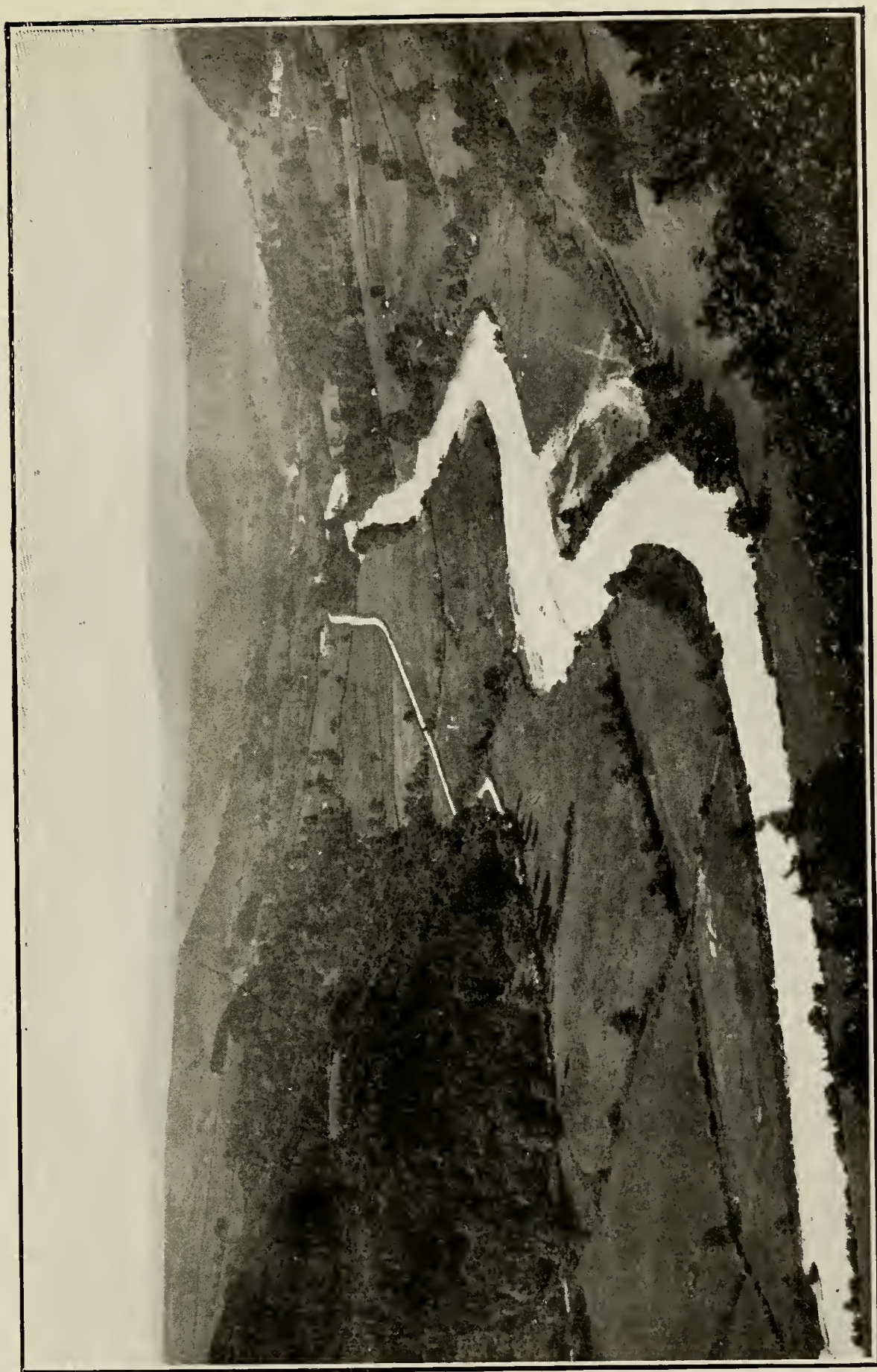


FIG. 38.—THE LAKE DISTRICT.

The untinted part of the land would be flooded if the sea rose 600 feet.

To the north of it there is a deep gap, shown on





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V. SWALEDALE.

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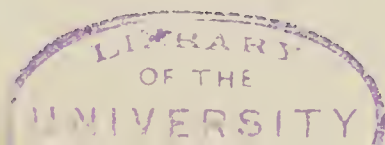








Plate II, p. 21, as a strip of green, which separates the Pennine Chain from the Cheviot Hills.

Looking from Cross Fell southward, eastward, and northward, you would see only the broad lofty moorlands which occupy the north-western corner of Yorkshire and the west end of Durham. Of these moors the highest are known as Ingleborough, Whernside, and Pennygiant (Plate III, p. 52).

Westward from Cross Fell, however, there is a very different scene. The mountain descends steeply into a long, beautiful valley through which the River Eden flows northward to Carlisle and Solway Firth. Across the Eden Valley rise the mountains of the Cumbrian Group, so named from the county of Cumberland, in which both they and the Eden Valley are mainly situated. These mountains are called a group rather than a chain, because they lie in a cluster almost as broad from east to west as from north to south.

Sometimes in the early morning the clouds fill the Eden Valley, and the spectator may look from the summit of Cross Fell over their white fleecy surface to the Cumbrian peaks, rising in the west like an island out of a cloud sea.

The Pennine Chain has in general a rounded and tame outline. It is covered to a great extent with peat and heath, which give it a dreary and desolate aspect.

But the mountains of the Cumbrian Group are

steep, bold, and angular. In some parts they are crowned with woods, and in others clothed with the finest greensward, but the highest points are of naked rock. The streams flow outward from the centre of the group, trenching the high ground with deep valleys, in the bottoms of which rest long winding lakes (Plate VIII, p. 85).

These lakes are so characteristic of the Cumbrian Mountains that this part of the country is often described as the Lake District.

The highest of the Cumbrian peaks are Sca Fell, Helvellyn, and Skiddaw, each rising to more than three thousand feet above the sea. The whole west coast, from Anglesea in Wales to the Mull of Galloway in Scotland, is visible from Sca Fell. It is the highest point in England, although not so high as several mountains in Wales. The hills of the Isle of Man are also visible, and, on one of those rare days of bright sunshine when there is neither haze in the air nor cloud in the sky, the mountains of Ireland can just be discerned on the horizon.

Wordsworth, who was one of the Lake Poets, so-called because they lived in the Lake District and loved it, has left us the following description of the top of Sca Fell:—

“On the summit no sound could be heard. There was not an insect to hum in the air. Round the top not a blade of grass is to be seen. Cushions

or tufts of moss, parched and brown, appear between the huge blocks and stones that lie in heaps on all sides to a great distance, like skeletons or bones of the earth." These stones are "covered with never-dying lichens, which the clouds and dews nourish and adorn with colours of vivid and exquisite beauty. Flowers, the most brilliant feathers, and even gems scarcely surpass in colouring some of these masses of stone, which no human eye beholds except the shepherd or traveller led thither by curiosity."

The Cumbrian Group is connected to the Pennine Chain by a moor a thousand feet high which is called Shap Fell. The water parting between the Eden flowing northward and the Lune flowing southward is on Shap Fell.

The London and North-Western Railway, following the West Coast Route, also comes over Shap Fell on its way from Lancaster to Carlisle. The ascent is a toilsome one, and the trains are usually hauled up by two engines, one of which is taken off again at the top. A tunnel, however, is to be bored through Shap Fell, so that the trains will not have to climb so high, and then the expresses will be able to make the journey between London and Glasgow quicker than now.

The longest of the lakes of the Cumbrian Group is Windermere, of which we have a view in Plate



VIII, p. 85. It is more than ten miles long, but not two miles broad, for it lies along the bottom of a valley.

Another lake, Thirlmere, in one of the northern valleys of the Cumbrian Group, has been utilized for the supply of water to the city of Manchester. The water is carried southward in a long tube known as an aqueduct. Let us measure the distance upon the map between Thirlmere and Manchester. That will tell us something of the magnitude of the engineering works which are now needed for the water supply of our large cities.

The difference between the romantic landscapes of the Lake District and the tamer scenery of the Pennine Chain, is due mainly to the difference of the rocks of which they are composed. In the Lake District we have chiefly jagged slates, set on edge, and hard volcanic stones dating from very early ages in the world's history.

In the Pennine Chain, on the other hand, the rock most widely spread is the millstone grit, a kind of sandstone, which, under the influence of the weather, wears into rounded mounds and long lines of slope, rather than into peaks.

In many parts of the Pennine Chain, however, there is a beautiful limestone, which gives rise to fine cliff scenery, especially in some of the dales (see Fig. 31, p. 56). This rock is well seen in the southern end of the chain, which is known as the Peak.

The valleys of the Dove and the Derwent there form remarkable gorges with limestone cliffs.

Wherever the limestone occurs, throughout the length and breadth of the range, great caverns opening to the hill slopes are common. They are



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FIG. 39.-- A LIMESTONE CAVE, CHEDDAR. ~

due to the underground water, which slowly dissolves the limestone, making long winding channels within its mass.

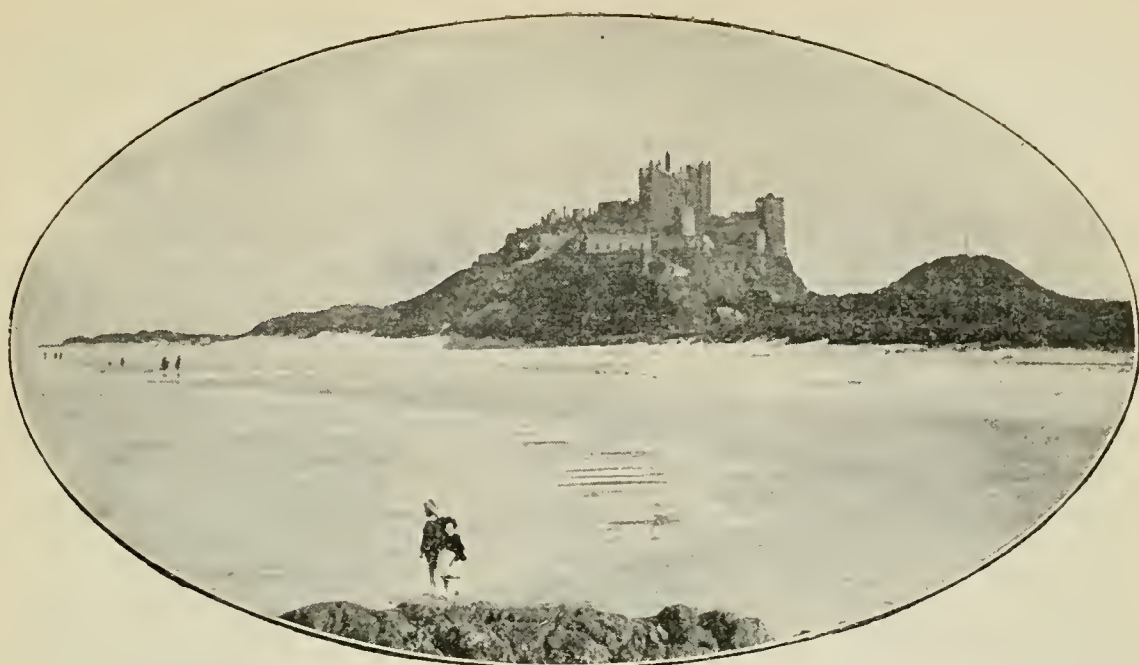
The cave of Ingleborough has been traced for half a mile. From its top hang beautiful pendants, and pillars descend to the floor; delicate open



arcades run along the ledges; and large flat sheets of limestone hang like stony banners from the walls. A little rivulet flows through the centre, and the great chambers are connected by low, narrow passages. White rats live in these caverns.

Whenever you can, you should get some pieces of the chief stones mentioned in this chapter—slate, sandstone, and limestone. You can scratch limestone with a pen-knife, but though you may break sandstone, you cannot really scratch it.





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[G. W. Wilson & Co., Aberdeen.

FIG. 40.—BAMBURGH CASTLE.

## CHAPTER XIII. THE BORDER

THE district midway through Great Britain, where the kingdoms of England and Scotland meet, is known as The Border. In the old times it was a wild region with few inhabitants, and these few were mostly gathered into castles and walled cities. For there were constant feuds and enmities between the peoples who dwelt to north and to south of the boundary between the two countries.

The frontier began in the west at the head of Solway Firth. Here there was formerly a marsh known as Solway Moss, which has now been drained. The frontier crossed this marsh and then ran up into the Cheviot Hills, and eastward

along their crest until they come suddenly to an end in a great domed hill, known as the Cheviot, visible far out on the North Sea. (See Plate VI, p. 69.)



FIG. 41.—THE BORDER.

If the sea rose 600 feet there would be a strait in the Tyne gap, but the Cheviot would still be 2,000 feet high.

From this hill the frontier turned northward to the river Tweed, and then followed the Tweed



north-eastward almost to its mouth. But the town of Berwick, on the left or Scottish bank, belonged to England.

The left bank of a river is that to your left hand when you look down the river in the direction of the sea.

The Cheviot Hills are a broad belt of high bleak moorlands, which rise eastward into the great dome, nearly three thousand feet in height, which has just been mentioned. In springtime the passengers on the coasting steamers, which ply from London and Newcastle to Leith and Aberdeen, see it capped with snow. It is then a striking mark of the border between the two kingdoms.

If you now look carefully at Fig. 41 you will see that there is a space about ten miles broad lying between the foot of the Cheviots and the sea coast. This is the chief gateway of Scotland. The county of Northumberland extends through it northward to the river Tweed.

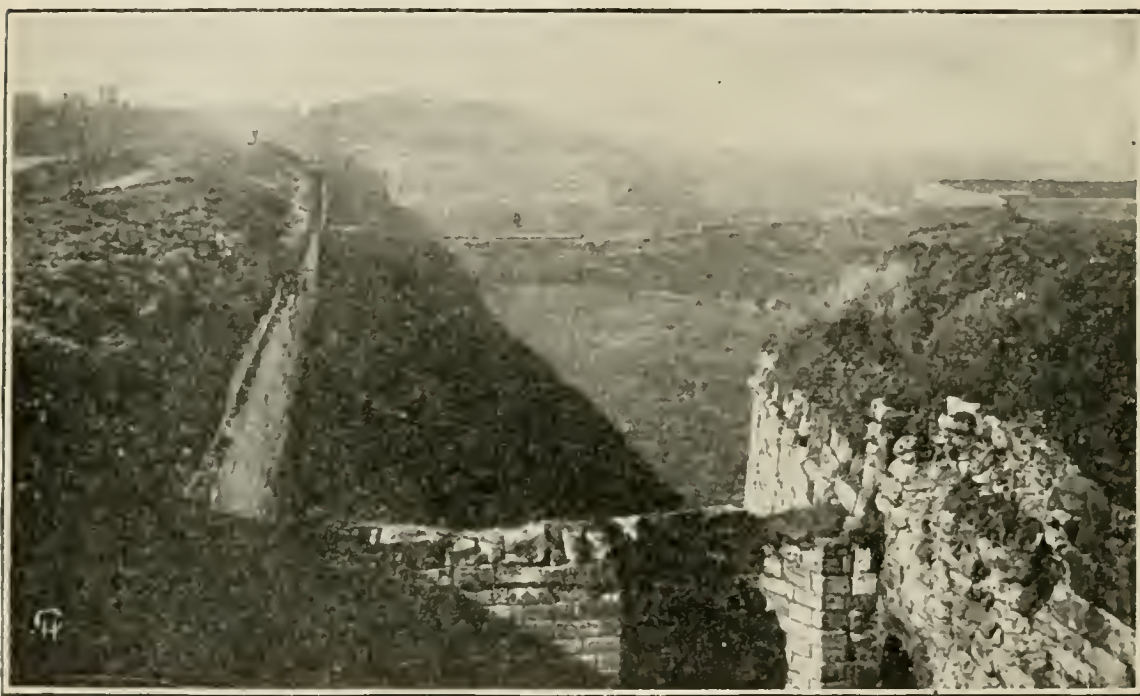
People in England often refer to Scotland as "North of the Tweed," and in Scotland people speak of England as "South of the Tweed." The map, however, shows you that the Tweed is only for a short distance the boundary between the two countries. How is it then that we describe Scotland as lying beyond the Tweed?

It is because men naturally avoided crossing the high Cheviot Hills when they could pass through



the gateway of low ground beside the North Sea. Nine out of every ten people who went to Scotland in the old days went by the east coast, and therefore crossed the Tweed.

The ancient walled town of Berwick was captured by England, and was held as a fortress to protect the north end of the bridge over the Tweed. On Plate IV, p. 52, you will see that there is a county



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FIG. 42.—THE OLD WALLS OF BERWICK-ON-TWEED.

called Berwickshire, which lost its county town when Berwick-on-Tweed was taken by England.

On the coast of Northumberland, just east of the Cheviots, there stands the old castle of Bamburgh, where was once the capital of the Kingdom of Northumbria. The ancestors of most of us came

as pirates over the North Sea, and one race of these pirates settled along the east coast, from the Humber in the south to the Forth beyond Edinburgh in the north. They founded the Kingdom of Northumbria, the land north of the Humber. Bamburgh, their capital, stood nearly midway from the Humber to the Forth (see Plate IV).

In later times the counties of Yorkshire and Durham were formed out of the southern part of the Northumbrian kingdom, and several counties of Scotland were formed from its northern parts. The county of Northumberland was thus all that remained, but it has kept the old name, although it lies a long way from the Humber.

Close by Bamburgh are some small islands. One of them is known as Holy Island. Here the Scottish missionary Aidan dwelt when converting the Northumbrians to Christianity. And here too after Aidan lived the saintly Cuthbert. Therefore the island is called Holy. Near by are the Farne Islands, where lived Grace Darling, whose name was heard all over Britain sixty years ago. She was daughter of the lighthouse keeper, and in a stormy sea rowed a boat out and rescued a shipwrecked crew.

Many battles have been fought near the east coast where it passes from England to Scotland. At the northern foot of the Cheviots, a short way from the Tweed, is the battlefield of Flodden, where James IV of Scotland and the chief of his nobility

were slain in the disaster described by Sir Walter Scott in "Marmion."

Tradition, legend, tune and song,  
Shall many an age that wail prolong;  
Still from the sire the son shall hear  
Of the stern strife and carnage drear  
Of Flodden's fatal field,  
When shiv'r'd was fair Scotland's spear,  
And broken was her shield.

Another celebrated battle was fought in these parts a hundred and fifty years earlier than Flodden. It was at Otterburn, on the south slope of the Cheviots, where they descend gradually towards the Tyne. Here a pass, called Carter Bar, leads over the top of the hills from the dale of the Teviot, a Scottish tributary of the Tweed.

At Otterburn the Scots under Douglas, who was killed, defeated the English under Hotspur, who was taken prisoner—incidents which gave occasion for the famous ballad of "Chevy Chase," which means Cheviot Forest.

Of twenty hundred Scottish spears  
Scarce fifty-five did flie.  
Of fifteen hundred Englishmen  
Went home but fifty-three;  
The rest were slain in Chevy Chase  
Under the greenwood tree.

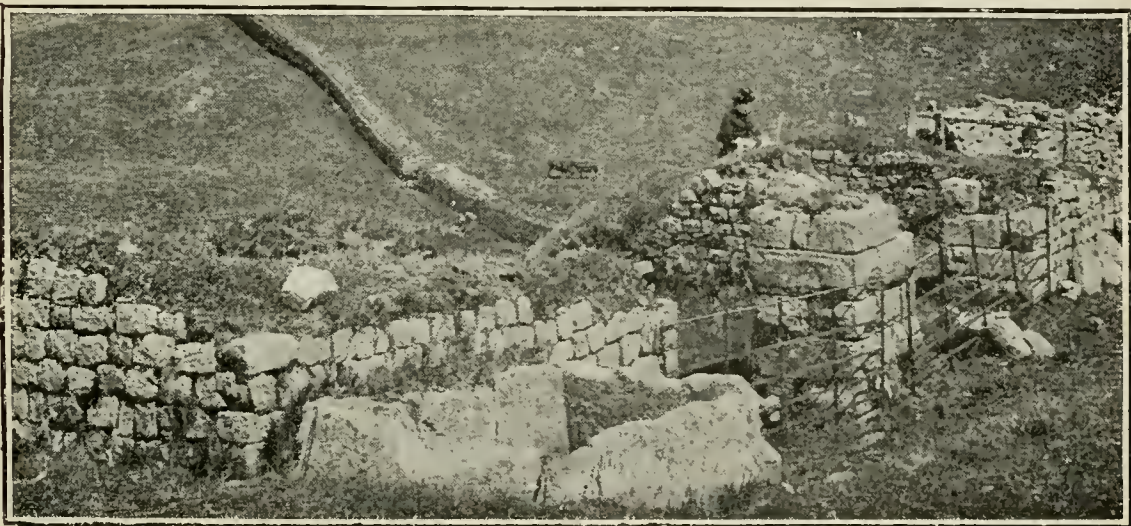
Between the Cheviots and the northern end of the Pennine Range there is, as we read in the last



chapter, a deep passage known as the Tyne Gap. To north and to south the moors rise to heights of two and three thousand feet, but the road and the railway from Newcastle to Carlisle lead through the gap, at an elevation of not much more than four hundred feet.

The Tyne Gap is thus a very deep notch in the backbone of England, and Newcastle and Carlisle have long been important towns, partly for the reason that they stand on the east and west coast roads just where there is a cross road through the Tyne Gap.

The Roman wall runs across the island just north of the Tyne Gap. It was built by the Romans, when they held England seventeen hundred years ago, for a barrier against the wild Caledonians of Scotland. It was built just here because Great Britain is only a little more than sixty



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FIG. 43.—THE ROMAN WALL.

miles across from the mouth of the Tyne to the head of Solway Firth.

Let us take the straight edge of a piece of paper, and let us find out from Plate X, p. 100, if there is any place where the island is again as narrow as it is here at the Border between England and Scotland.





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FIG. 44.—THE RUINS OF MELROSE ABBEY.

## CHAPTER XIV. THE SOUTHERN UPLANDS OF SCOTLAND

LET us take a straight edge of paper, and laying it across the south of Scotland in a north-easterly direction, let us mark off and measure the distance from Port Patrick, on the North Channel, to St. Abb's Head, on the east coast a little north of Berwick. This we may do on Plate VI, p. 69. We shall find that the distance is very nearly the same as the length of the Pennine Range.

Through this space, from the North Channel to



the North Sea, extends a broad belt of green hills, which are known as the Southern Uplands of Scotland. Several million sheep live upon their mountain pastures and in their winding valleys.

The Cheviot Hills are a branch of these Southern Uplands, thrown off eastward from the Lowther Hills, which are the central knot of the system. Between the Cheviots and the Southern Uplands, in a north-easterly direction, is the broad dale of the Teviot, a tributary of the Tweed. But the two most important rivers of the Southern Uplands are the Tweed itself and the Nith.

The Tweed flows eastward to Berwick-on-Tweed. Down in its valley, about the middle of its course, is the Abbey of Melrose, perhaps the most beautiful ruin in Britain, and close at hand is Abbotsford, the home of Sir Walter Scott. It was he who wrote—

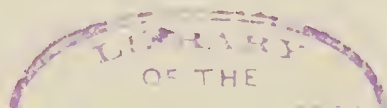
If thou would'st view fair Melrose aright,  
Go visit it by the pale moonlight ;  
For the gay beams of lightsome day  
Gild, but to flout, the ruins grey.

Scott loved the Tweed and the Border, and wrote much about them, just as Wordsworth loved the Lake District and described it. To-day there are manufacturing towns, Galashiels and Peebles, beside the Tweed and its tributaries. Here the wool of the hills is woven into the famous cloths which are known the world over as tweeds.

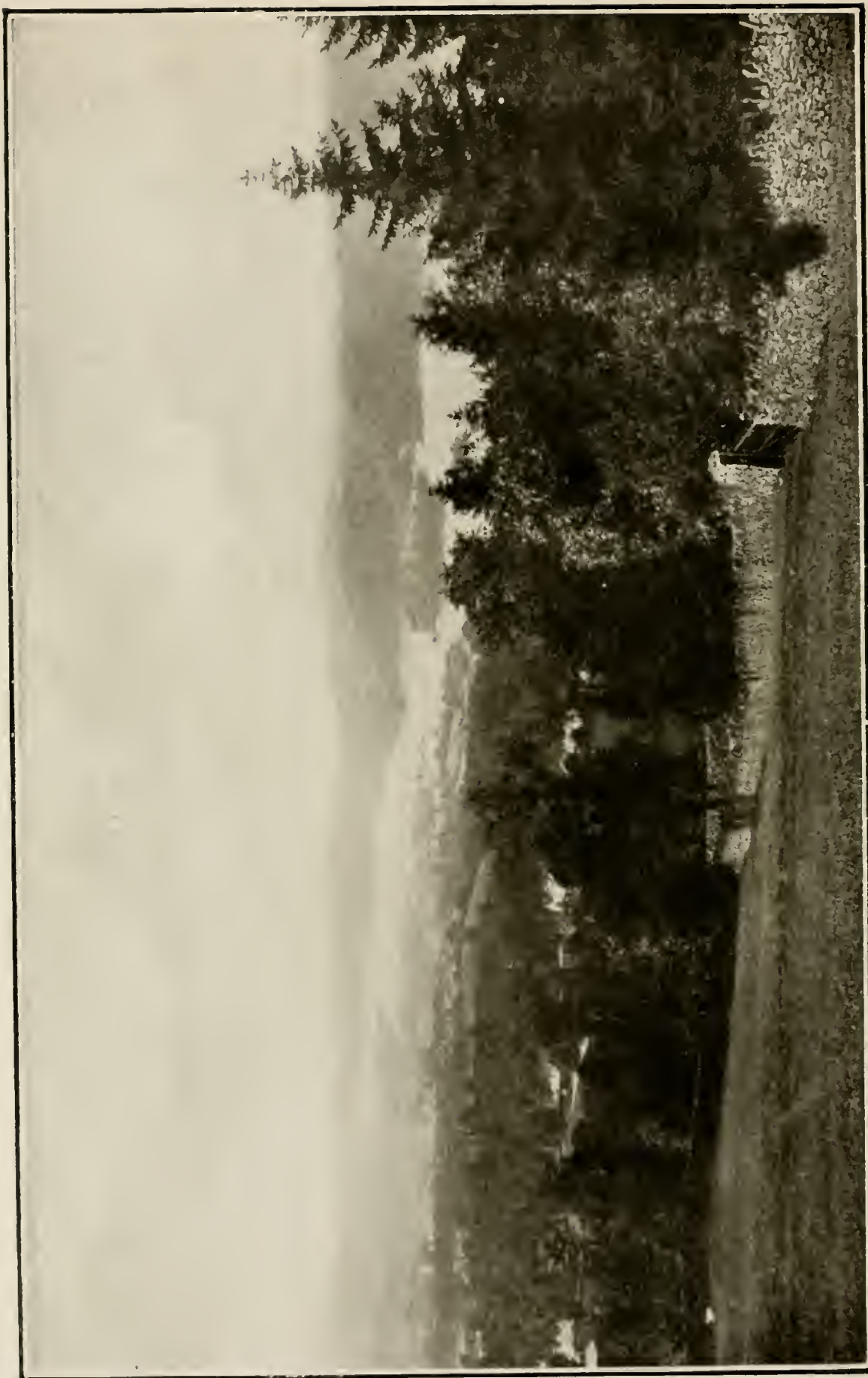




VII. NORTHERN SCOTLAND, PHYSICAL.







Copyright.]

VIII. WINDERMERE.

[F. Frith & Co., Ltd.



The Nith is a remarkable although not a very large river. It rises on the north slope of the Uplands, and then turning round, flows completely through them by a deep valley known as Nithsdale. Passing the town of Dumfries, it empties itself into Solway Firth. Thus the Southern Uplands are trenched through by a natural roadway, which is to-day followed by the Glasgow and South-Western Railway, coming from Carlisle and Dumfries, and going to Kilmarnock and Glasgow.

The chief town of south-western Scotland is Dumfries, placed where the road from the south bridges the Nith and then branches into two roads. On the one hand there runs northward, through Nithsdale, the way to Glasgow, which we have just described ; on the other hand the road to northern Ireland follows the southern foot of the Uplands into Galloway, the promontory ending in the curious hammer-shaped peninsula known as the Rhinns of Galloway. Here the mountains of Ireland are in sight across the North Channel, and steamers go over to Belfast, carrying the passengers who have come from London through Carlisle and Dumfries, and also the passengers who have come direct from Glasgow.

When we last saw our foreign friend, who rode from Dover on his motor car by way of Derby and Newcastle, we left him on the top of Cross Fell.

He would no doubt return to Newcastle for his car, and we will now advise him to come through the Tyne Gap to Carlisle, and then to run northward up Annandale.

The main line of the Caledonian Railway ascends Annandale to the pass of Beattock. You will remember that the west coast expresses from London have to climb to the top of Shap Fell, a height of a thousand feet, in order to pass from Lancashire into Cumberland. In Scotland, at the pass of Beattock, they must again rise to a thousand feet before they can descend into the head of Clydesdale. Down in the Scottish Lowland beyond, they are often divided at Carstairs Junction, the one part running north-eastward to Edinburgh, and the other north-westward to Glasgow.

Close beside Beattock is the green flat summit of Hart Fell, twenty-six hundred feet high, in which is the source of the Tweed. Let us propose to our traveller that he break his journey at Beattock, and that he climb Hart Fell. If the day be quite clear, he will look southward across Solway Firth to the peak of Skiddaw in the Lake District, and at the same time he will see far away in the north-west, across all the busy lowland of central Scotland, the highland peak of Ben Lomond. You should measure these distances, in order that you may realize how large a part of Great Britain is sometimes visible from a single hill.

Close to Beattock is a village called Leadhills, at a height of fifteen hundred feet, in a most bleak and exposed situation. It is said to be the highest permanently inhabited spot in Great Britain. A few huts of shepherds and gamekeepers in the Northern Highlands may stand at a greater elevation, but they are not occupied all the year round.

---

Now let us try to print upon our memories the map of the hills which fill northern England and southern Scotland. Draw an outline of the coasts of the central portion of Great Britain. Take a pencil and shade over all the district covered by the Southern Uplands of Scotland, being careful to give them sufficient breadth. Leave a narrow space unshaded, however, where Nithsdale cuts its way from north-west to south-east. Be careful also to leave unshaded the lower valley of the Tweed and the valley of the Teviot, so that the Cheviot Hills may be seen to branch eastward from the main belt of the Southern Uplands.

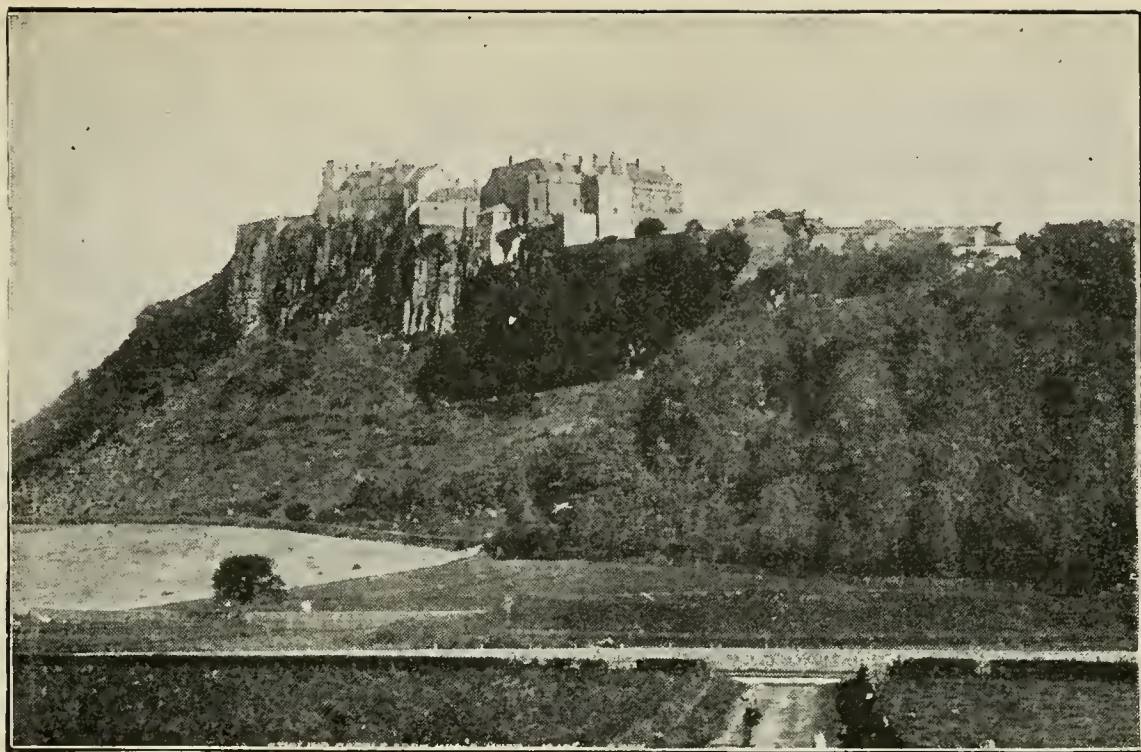
Now carry your shading in a similar way over the length and breadth of the Cheviot Hills, the Pennine Chain, and the Cumbrian Group. The shading will, of course, cover Shap Fell, and so connect the Pennines and the Cumbrian Mountains. Leave a passage unshaded across the Pennine Chain where the Aire Gap traverses it from east to west, making a natural way from York-



shire into Lancashire. Lastly, be very careful to leave the Eden Valley unshaded, and above all the deep passage at the Tyne Gap.

When you have done all this, try to think what the land would look like, if clouds filled the valleys and covered the lowlands at a height of about 600 feet. White cloud would fill the space over Solway Firth, and narrow bands of cloud would extend through Nithsdale, through the Tyne Gap, and up the Eden Valley. Cloud would cover all the centre of Scotland and all the seas around, and a thread of cloud would mark the Aire Gap. In the south, the Peak of Derbyshire would stand out like a great promontory in the midst of a rolling sea of fleecy cloud covering the Midlands of England.

The broad moorlands which fill so much of the south of Scotland and of the north of England, would rise above the clouds like a group of islands separated by narrow straits. They would be islands without hedges and almost without trees, with sheep and grouse for their most numerous inhabitants. For nearly all the wealth and activity of men would be down on the lowlands beneath the clouds, in the valleys, and on the coasts.



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FIG. 45.—STIRLING CASTLE.

Look also at Plate IX, p. 100.

## CHAPTER XV. THE GRAMPIAN HIGHLANDS

SCOTLAND consists of three parts, the South, the Centre, and the North. Of these parts, the South and the North are composed for the most part of high ground, while the Centre between them lies low, as you may see in Plate X, p. 100.

In the South, towards the English border, are the Southern Uplands, which, as we have seen, are chiefly inhabited by sheep and their shepherds. The Centre contains the two great cities, Edinburgh and Glasgow, which have made Scotland, though a small country, famous throughout the



world. In the North are the Highlands, even more thinly peopled than the Southern Uplands, and wilder and more beautiful.

Let us leave the Centre of Scotland till last, and let us cross now from the Southern Uplands to the Highlands. We will ask our foreign friend to come with us to the old town of Stirling, and having left his baggage at the inn, to walk in the evening to the castle, which crowns a rocky crag, and to look out northward from its ramparts. If he is lucky in the matter of weather, he will see one of the finest views in all Britain (Plate IX, p. 100).

Below him, at the foot of the castle rock, beyond some corn fields, are the bends or links, as they are called, of the River Forth, shining in the midst of the plain. Behind these his view will be closed by a range of mountains, which runs in a straight line from south-west past his front to north-east, completely crossing Scotland. Far away in the west, standing out against the brilliant evening sky, he will note at the end of the range the peak of Ben Lomond, which he saw from the top of Hart Fell.

Let us turn to Plate VII, p. 84, and find the town of Helensburgh, to the south of Ben Lomond, on the west coast. Then let us find the town of Stonehaven on the east coast, lying much farther north than Helensburgh. Place the straight edge of a sheet of paper across Scotland from Helensburgh



to Stonehaven. The line so found marks the range of the Grampians, part of which is visible from Stirling Castle. You can easily measure its length by means of the scale on the map.

The Grampians are not, however, in reality a mountain chain, but the steep craggy edge of a great tableland, which fills nearly all the north of Scotland. This tableland is known as the Highlands.

It rises higher than either the Southern Uplands or the Pennine Moorlands, and is broader and altogether more massive. Like them it receives plentiful rain, and deep snow, with the west winds from the Atlantic. Therefore many rivers have their sources in the heart of it, and flow through deep winding valleys outward to the low ground and the coasts. These Highland valleys are called glens, not dales as in the Southern Uplands and in the Pennines.

You see therefore that you must think of the Highlands as a vast uneven slab of rock whose Grampian edge overlooks the Central Lowlands. Notched into the surface of this slab are many narrow and deep glens. Treeless moors spread over the broad tops, but the glen-sides are often wooded, and the rapid torrents in their bottoms here and there spread out into long narrow lakes. The glens, therefore, are the most beautiful parts of the Highland country.

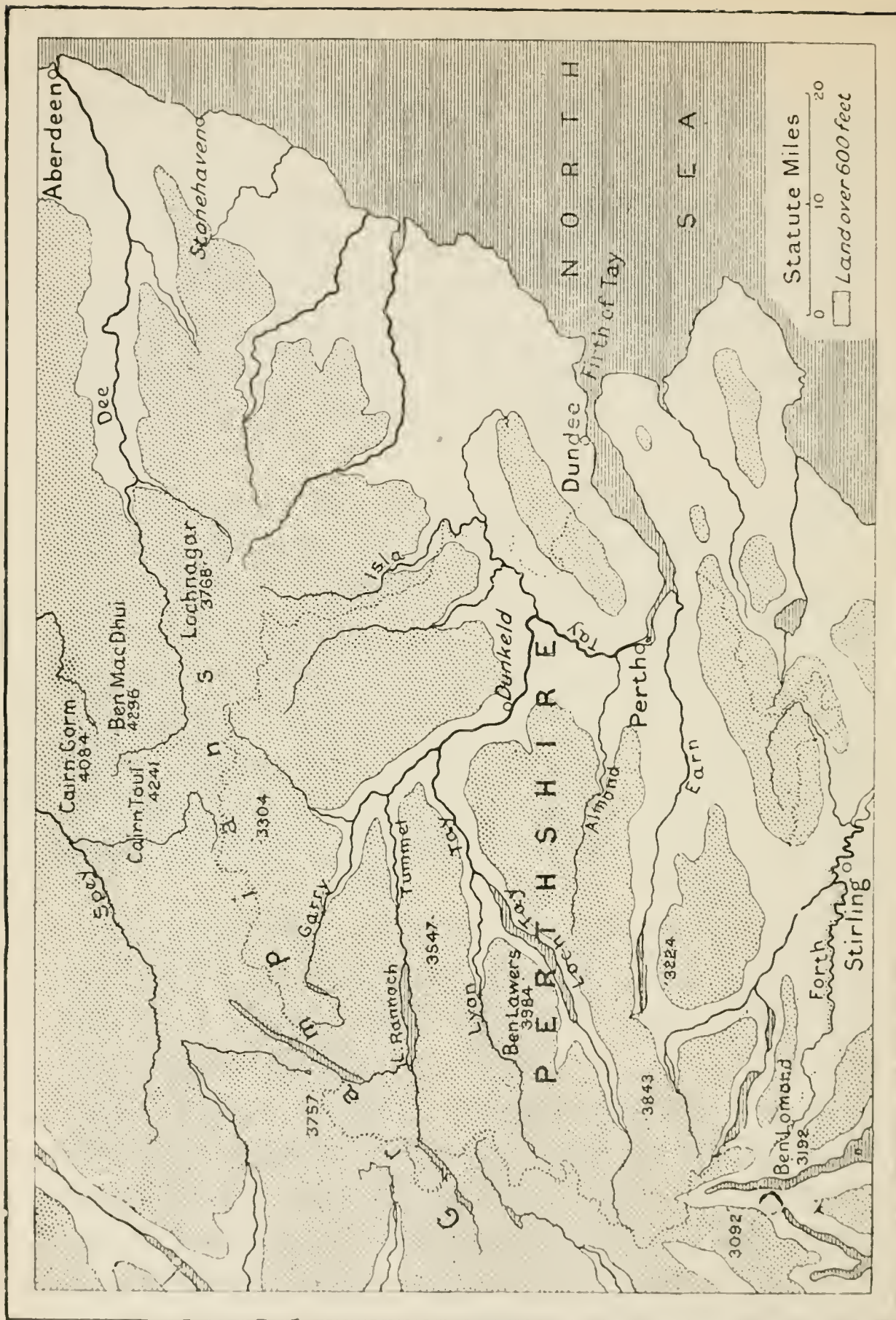


FIG. 46.—PERTHSHIRE.



If you look at the large county of Perthshire (Plate VII and Fig. 46), you will see that all its glens gather together to form the Tay, the largest river in Scotland. Indeed, Perthshire very nearly coincides with the basin of the Tay, just as we saw that Yorkshire nearly coincides with the basin of the Ouse.

The Tay emerges from the Highlands at Dunkeld, which is placed on the line between Stonehaven and Helensburgh. After Dunkeld the river winds past the city of Perth, through the lower country, outside the Highlands. It enters the North Sea by a great tidal estuary, the Firth of Tay, upon which stands the port of Dundee. The Tay brings down more water than any other river in Britain, but its sources are high in the mountains, and it flows too rapidly to be navigable above the tideway.

If you look at that part of the Tay basin which lies within the Highlands you will see a long lake called Loch Tay. This lake lies less than 300 feet above the sea, but on either hand are the steep sides of the Glen, rising to heights of nearly 4,000 feet. So deeply is Glen Tay cut into the Highland mass ! If you climb the slope to north of the loch you will stand at last on the summit of Ben Lawers, and on all sides you will see the rolling heathery Highlands, with here and there a pointed peak standing up from the more rounded outlines.





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FIG. 47.—RED DEER.

Now look again at Plate VII, and see how the Grampian Highlands, coloured brown in the map, extend north-eastward into a great shoulder of land, which is thrust forward into the North Sea. This promontory is known as Buchan, and one of its capes is Buchan Ness. Towards the end of it the Highlands sink to lower ground, which is of course shown in green.

See how the rivers flow from the centre of the Highlands south-eastward, eastward, and north-eastward to the sea around Buchan. The main course of the Tay is south-eastward; the courses of the Spey and the Findhorn are north-eastward, while the Don and the Dee flow eastward. The

King's castle of Balmoral is in the glen of the Dee, and the great port of Aberdeen at its mouth.

The promontory of Buchan is therefore not very unlike the promontory of Cumberland between Solway Firth and the Irish Sea, for there also the dales and the lakes run outward to the sea from the higher ground in the centre.

Just in this central district of the Highlands,



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FIG. 48.—A GOLDEN EAGLE.

where the rivers have their sources, there is a group of heights which, on account both of mass and elevation, is the most important in all the British Isles. The loftiest moor among them is Ben Mac-Dhui, and others nearly as high are Cairn Gorm and Cairn Toul.

There is a single point elsewhere in Scotland, Ben Nevis, which is a little higher, but no such group of summits. Through half the year they are thickly covered with snow, but in the late summer they become brilliant with purple heather. Here is the natural home of the red deer, and the grouse, and the golden eagle.

Another summit close at hand is Lochnagar, of which Byron wrote the following description—

Round Lochnagar, while the stormy mist gathers,  
Winter presides in his cold icy car;  
Clouds there encircle the forms of my fathers,  
They dwell in the tempests of dark Lochnagar.  
England! thy beauties are tame and domestic  
To one who has roved on the mountains afar!  
Oh! for the crags that are wild and majestic!  
The steep frowning glories of dark Lochnagar.



## CHAPTER XVI. THE HIGHLANDERS

HAS it struck you that the Highland names in the last chapter were of a different kind from those of the Southern Uplands or of the Pennines ? In the Highlands of Scotland a deep valley is called Glen, not Dale ; a mountain is called Ben, not Fell ; and a lake is called Loch, not Mere. Thus in the Highlands we have Glen Tay, Ben Lomond, and Loch Tay, but farther south we have Nithsdale, and Sca Fell, and Windermere.

The reason is that the people who live in the Highlands are of a different race, and speak a different language, from those who live in the south of Scotland and the north of England. English is, of course, the language of the latter regions, and Dale, Fell, and Mere are English words, although they are not often heard in the south of England, because the country there is low and there are no mountains, and mountain lakes, and deep valleys.

But the Scottish Highlanders are Celts, and speak a language called Gaelic. They naturally named their hills and lakes for themselves, and when English-speakers first travelled among them, and asked “ What do you call this mountain or



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Aberdeen.*

FIG. 49.—A HIGHLANDER.

this lake? ”, the answer given was in Gaelic.

The Highlanders were a wild people only a hundred and sixty years ago. Their tribes were known as clans, and over each clan there ruled a chief. All the people of a clan had the same surname, which often began with Mac. Thus the MacDonalds, the MacLeods, and the MacKinnons were three of the clans.

They wore a different dress from the Lowlanders, more suited to the climbing of rough hills, through bog and snow. Of this dress the kilt and the plaid were parts, and were made of cloth woven into patterns, so that each clan had its own pattern or tartan. Their main wealth consisted of rough shaggy cattle which the Highlanders drove down the glens to sell to the English-speaking Lowlanders.

There was much fighting between the clans, but the Lowlanders were their chief enemy. They often raided the cultivated plains, and then withdrew to their mountains, through whose glens

there were then no roads. When the Lowlanders went to punish them, they were often ambushed in the glens and defeated. The most celebrated of these glen fights was at Killiecrankie, in Glen Tummel, which is tributary to Glen Tay in Perthshire.

But the most famous event in Highland history occurred in 1745. Then, as you know, George II was king. He belonged to the Hanoverian family, which had been brought over to England to replace the kings of the Stuart family, who would not rule according to the Constitution.

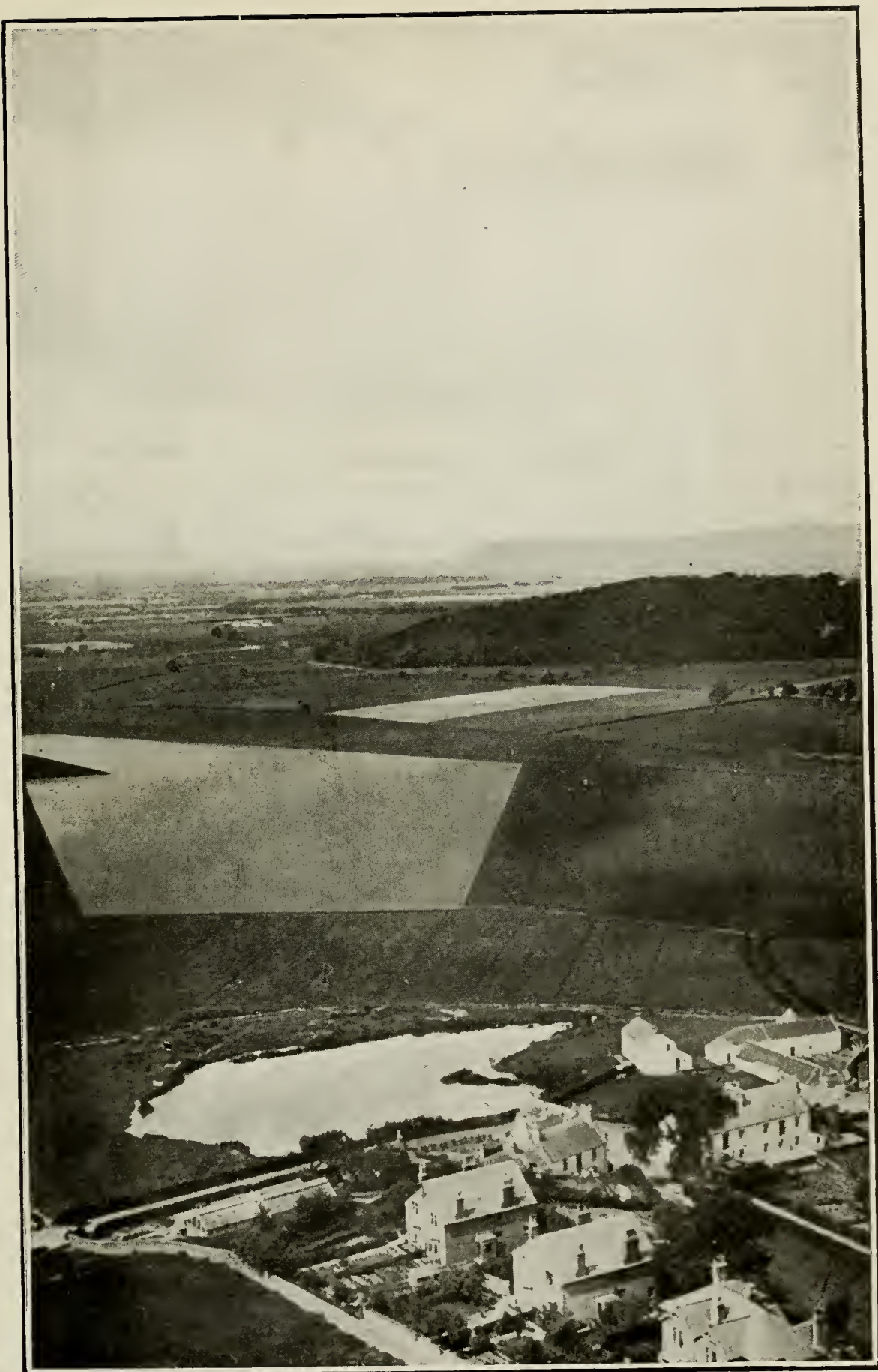
Some of the Stuarts, however, took refuge in France, and for a long time there were people in England and Scotland who wished to bring them back. Such people were called Jacobites, because they were partisans of King James II. The Latin word for James is Jacobus.

Now the Jacobite or Stuart party was very strong in the Highlands, and therefore when Prince Charlie, the grandson of James II, landed on the west coast of the Highlands, many of the clans gathered round him. Thus he was able to lead a Highland army southward, not only through the Lowlands round Edinburgh and Glasgow, but over the Southern Uplands down into Carlisle, and over Shap Fell down again into Lancashire, and through Manchester to Derby. He marched, in other words, by what we should now call the West Coast

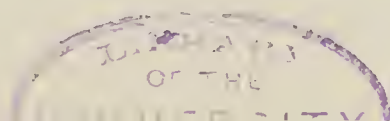


Route. But when he got to Derby, finding that England was not with him, he was obliged to retreat to the Highlands, and finally he escaped back to France.

The Highlanders were then conquered by the English and the English-speaking Scotch of Edinburgh and Glasgow, and roads were made through some of their glens. They were even forbidden to wear the Highland dress, but liberty for that was afterwards restored to them. So the Highlanders at last became peaceable citizens, although in many parts they still speak Gaelic more readily than English.



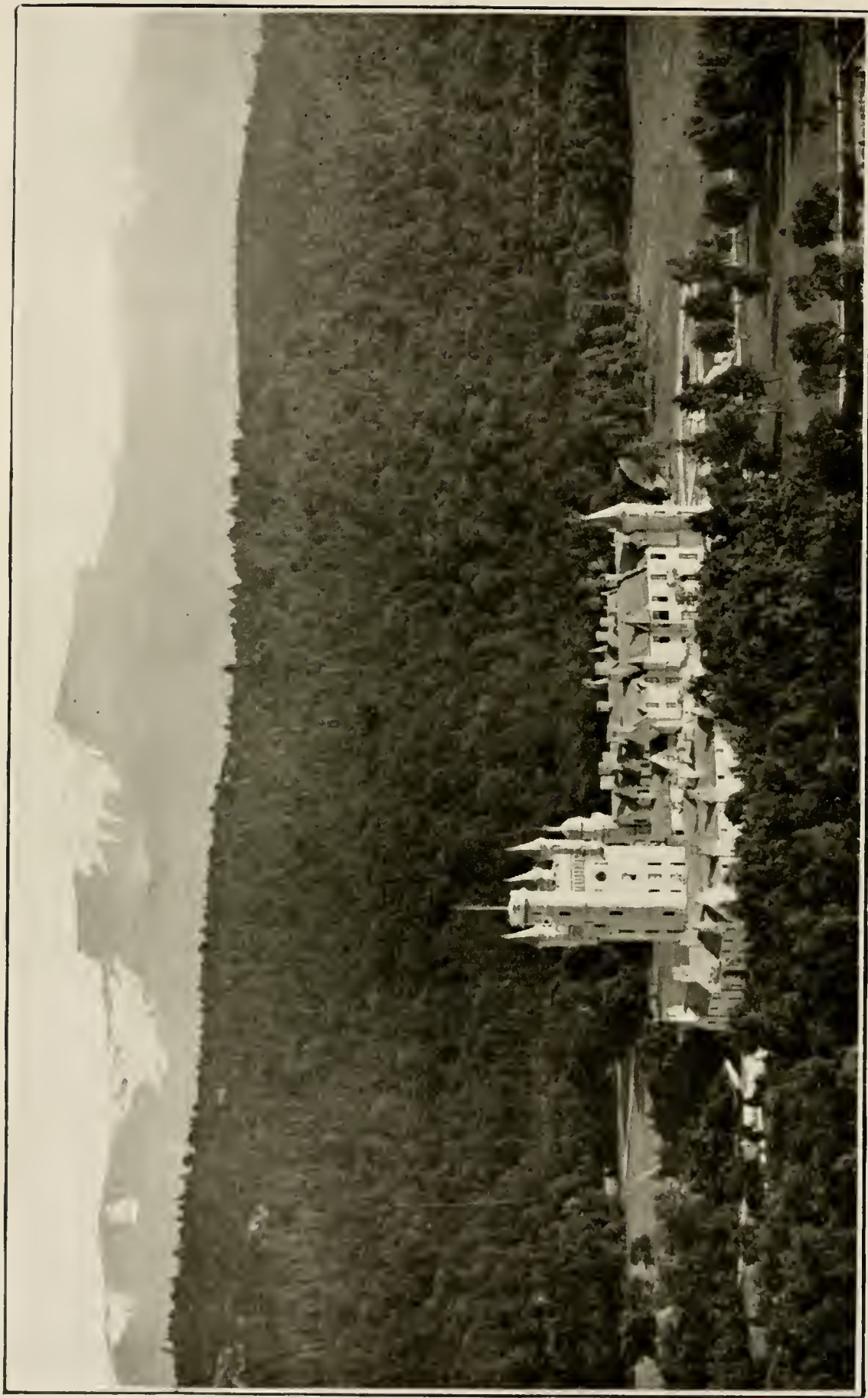
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IX. VIEW FROM STIRLING CASTLE.











*Copyright.]*

Na. BALMORAL CASTLE.

[G. W. Wilson & Co., Aberdeen,



## CHAPTER XVII. THE NORTHERN HIGHLANDS

No one can look at the map of Scotland (Plate VII, p. 84) without noticing a line of narrow lochs crossing the Highlands from south-west to north-east, in a direction so straight that they might have been cut with a knife. These lochs lie along the bottom of Glenmore, a word which means in Gaelic the "Great Glen." The Highlands are so deeply trenched by Glenmore that they are severed into two parts, the Grampian Highlands to the south-east and the Northern Highlands to the north-west.

The Northern Highlands are even more lonely and barren than the Grampians. Sir Walter Scott has described them in the following passage—

Stranger, if e'er thine ardent step has traced  
The northern realms of ancient Caledon,  
Where the proud Queen of Wilderness hath placed,  
By lake and cataract, her lonely throne ;  
Sublime but sad delight thy soul hath known,  
Gazing on pathless glen and mountain high,  
Listing, where from the cliffs the torrents thrown,  
Mingle their echoes with the eagles' cry,  
And with the sounding lake and with the moaning sky



The lochs of Glenmore have been chained together by short canals, and a water-way has been formed from sea to sea. It is known as the Caledonian Canal, and allows small ships to go from the Atlantic to the North Sea, so avoiding the stormy passage round the north of Scotland. Caledonia was the Latin name for the Scottish Highlands.

The longest loch in Glenmore is Loch Ness, which drains north-eastward by the short river Ness. Let us measure the length of the Great Glen from Fort William to Inverness, which means "at the mouth of the Ness."

Along their western edge the Highlands present to the Atlantic a front of great cliffs, which jut out into the ocean, as the map shows clearly, in a long series of promontories. It is therefore almost impossible to make a road northward along this coast, and most of the traffic is done on the water from Glasgow, and from the three or four points where railways have lately been made through the Highlands to the Western Sea.

On the east coast, on the other hand, the Highlands fall, not directly to the North Sea, but to a strip of low plain along the shore. Therefore there is here room for a road northward from Edinburgh.

Do you remember the strip of green plain which our foreign traveller saw from Stirling Castle spreading away to the foot of the Grampians? That strip is known as Strathmore, or the Great

Strath, to distinguish it from Glenmore, the Great Glen. The word Strath signifies a broad flat-bottomed valley, whereas, as you know, a glen is narrow.

Strathmore extends north-eastward in front of the Grampians to the coast near Stonehaven, and the old railway from Edinburgh ran through it, as you may see from Fig. 68, p. 137, round the heads of the Firths of Forth and Tay. The bridges were at Stirling and Perth. But the most direct railway now crosses the Firths lower down by two of the grandest bridges in the world, the Forth bridge and the Tay bridge. You will find a picture of the Forth Bridge in the frontispiece (Fig. 1).

Near Stonehaven the Highlands come close to the sea, and leave only just room for the road and the railway northward; but beyond Aberdeen the coastal plain spreads out again and occupies the broad promontory of Buchan, a well-cultivated district with a considerable population. Here the railway is carried inland along the edge of the Highlands, direct from Aberdeen to Banff.

A strip of lowland, from five to ten miles broad, known as Moray, extends from Banff westward along the coast to Inverness. Therefore Moray Firth is the name of the great arm of the North Sea which enters Scotland between the headlands of Buchan and Caithness.

Beyond Inverness the land stands forward



again in the promontory of Caithness, which is like Buchan in outline, but somewhat smaller. Caithness is comparatively low, and there are some low peninsulas along the coast near Inverness. All these facts you may learn from Plate VII by paying attention to the green and brown colouring.

The low country along the east coast is made for the most part of red sandstone, which breaks up into fertile soil, whereas both the Grampian and the Northern Highlands are made of hard schists and slates. Schist is a rock not unlike slate, but harder and crumpled.

Most of the agricultural population of the north of Scotland is therefore gathered along the east coast, and the chief market towns are there. As you will see on the map the towns are usually at the mouths of the rivers, so that the Highlanders may come down to them from the glens, and that shipping may enter from the sea.

But there are two towns in the north larger than the rest, Inverness and Aberdeen. Why have these places grown more than the other towns in their neighbourhood ?

Inverness is at the point where the road and the canal through Glenmore, and the coast road and railway from Caithness gather together to a junction. Lately the Highland railway has been carried southward from Inverness through the Highlands at a great cost, but until that was done



the only railway to the south led eastward from Inverness along the Moray coast towards Banff and Buchan. The name Inverness means, as we have said, "at the mouth of the Ness."

Aberdeen stands at a like gathering of ways. They come down the glens of the Dee and the Don, from Inverness through Banff, and from all the low country of Buchan. But there is only one way by land from Aberdeen southward. It is nipped at Stonehaven between the Highlands and the sea. The name Aberdeen means "at the mouth of the Dee," for there are two Celtic words meaning mouth, Inver and Aber.

Have you ever noticed that there is often a blacksmith's shop where two roads cross in the country? The smith has of course more horses to shoe from two roads than from one. So it is with other businesses. Because, therefore, many ways join together at Inverness and Aberdeen, these places have grown to be large towns. Moreover, they are seaports.



FIG. 50.—VIKING OR NORSE SHIPS.

## CHAPTER XVIII. THE NORTHERN AND WESTERN ISLES

IN the far north-west of Scotland a lofty cliff of hard dark rock stands sharply up from the ocean, like the prow of a great ship. The waves beat at its foot, and the wild seabirds fly on its face in their thousands and nest on its ledges. This headland is called Cape Wrath.

At first you would think that the name had in some way to do with the stern strength of the rock or the anger of the storms. But that is not what

the word means, for it is not an English word. Cape Wrath was so named by the pirates who, eight hundred years ago, infested all the seas to the north and west of Scotland.

These pirates were Norsemen—that is to say, North men—and they came from Norway. They took possession of the Shetland and Orkney Islands to the north of Scotland, and then they passed round Cape Wrath and seized the Western Isles, which are also called the Hebrides. They even passed through St. Patrick's Channel and captured the Isle of Man in the midst of the Irish Sea. For four hundred years their kingdom of the Isles and Man remained separate from the kingdom of Scotland.

In the language of these Norsemen, which was very like the language spoken by the Norwegians of to-day, the word Wrath meant a corner. Cape Wrath was so named because it stands where ships coming westward from Norway turned southward, between the Western Isles and the mainland of Scotland, through the Channel of the Minch (Plate X, p. 100, and Fig. 53, p. 112).

The first islands to which the Norsemen came were the Shetlands, standing in the entry to the North Sea, like a stepping-stone between Norway and Scotland (Fig. 6, p. 9). There are over a hundred Shetland Islands, about thirty-two of them inhabited. Although the largest, known as Mainland, is sixty miles long and over twenty miles wide, its



coast line is so cut up by deep fiords that no part of it is more than three miles from the shore.

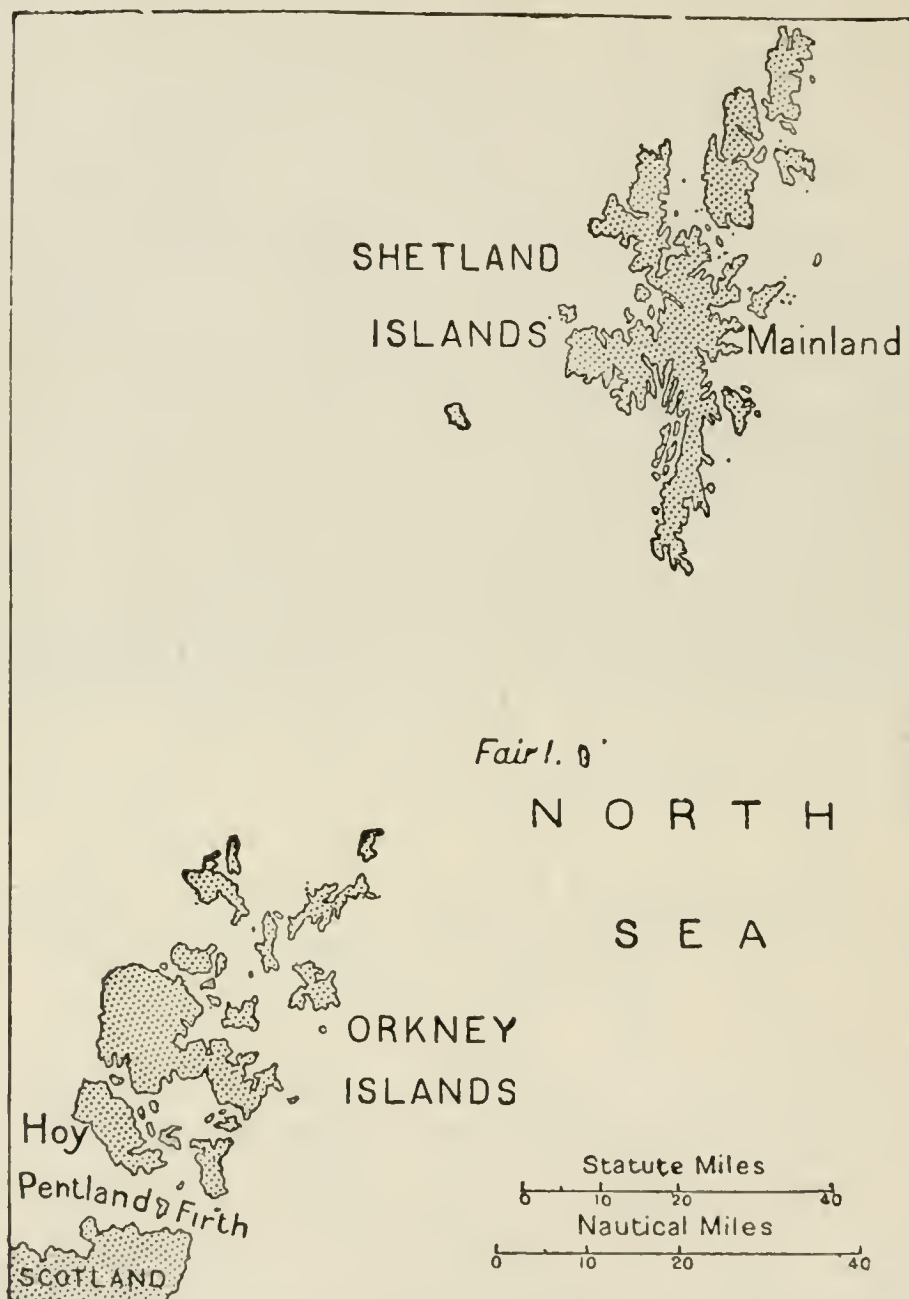


FIG. 51.—THE ORKNEY AND SHETLAND ISLANDS.

Inland the Shetlands are often dreary and desolate, but their promontories tower grandly over the stormy sea, with summits lost in the mist, and

innumerable caverns along the shore. They have been well described as the skeleton of a departed land. The softer rocks have all been washed away, and only the harder rocks have withstood the fury of the Atlantic waves.



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FIG. 52.—SHETLAND PONIES.

The Shetlands are famous for a race of small shaggy ponies, so hardy that they can live on the hills through the winter storms. The people speak English, not Gaelic, and are descendants of the Norsemen, not of the Celtic Highlanders.

Midway between the Orkney and the Shetland Isles is a lonely rock called Fair Island. Upon this



the Admiral of the Spanish Armada was wrecked in the reign of Queen Elizabeth.

The Armada came from Spain, as you will remember from Chapter II, in the year 1588. It sailed up the English Channel in order to convey a Spanish army from Belgium for the invasion of England. But the Armada was defeated in the Strait of Dover, and fled through the North Sea, and round the north of Scotland, and the west of Ireland, losing ships by wreck all the way, so that very few indeed ever returned to Spain.

Unlike the Shetlands, the Orkney Islands, separated from Scotland by the stormy Pentland Firth, are comparatively low. They are made of the same red sandstone that is so frequent along the low east coast of Scotland, whereas the Shetlands consist of the hard rocks which compose the Highlands.

One of the Orkneys, however, named Hoy, has a lofty and remarkable crag, called the Old Man of Hoy, which is pierced by an arch at its base, due to the ceaseless wearing of the waves.

On the other side of Cape Wrath, along the west of the Highlands, Scotland is fringed for more than two hundred miles with a great series of promontories and peninsulas, and there are hundreds of islands scattered over the neighbouring sea.

These islands are the Hebrides, and are in two groups. The Inner Hebrides lie somewhat to the



south, and close to the mainland, but the Outer Hebrides form a chain, more than a hundred miles long, which is divided from Scotland and from the Inner Hebrides by the Minch. The straits separating the Outer Hebrides are so narrow, that the whole length of the chain is often spoken of as Long Island, as though it were a single land.

The Outer Hebrides act as a great break-water, protecting the west coast of Scotland from the worst strength of the Atlantic billows. Such are the gales to which they are exposed that, except at one or two points, there are no trees even in the valleys.

Far out of sight of other lands, to west of the Outer Hebrides, lies the solitary St. Kilda, the most lonesome of the inhabited British Isles. It consists of three islets, surrounded by ten or twelve "stacks" of rock, which are very nearly vertical, and hardly to be approached except by sea fowl.

There are only about fifty people on St. Kilda, who are visited three or four times every summer by a steamer from Glasgow. The men are bird catchers and the women wool weavers. The sheep of St. Kilda are of a kind not found anywhere else in the world. They are the last of a species which was common in England in the time of the ancient Britons.

Remoter still, nearly two hundred miles westward of St. Kilda, Rockall rises from the surface of

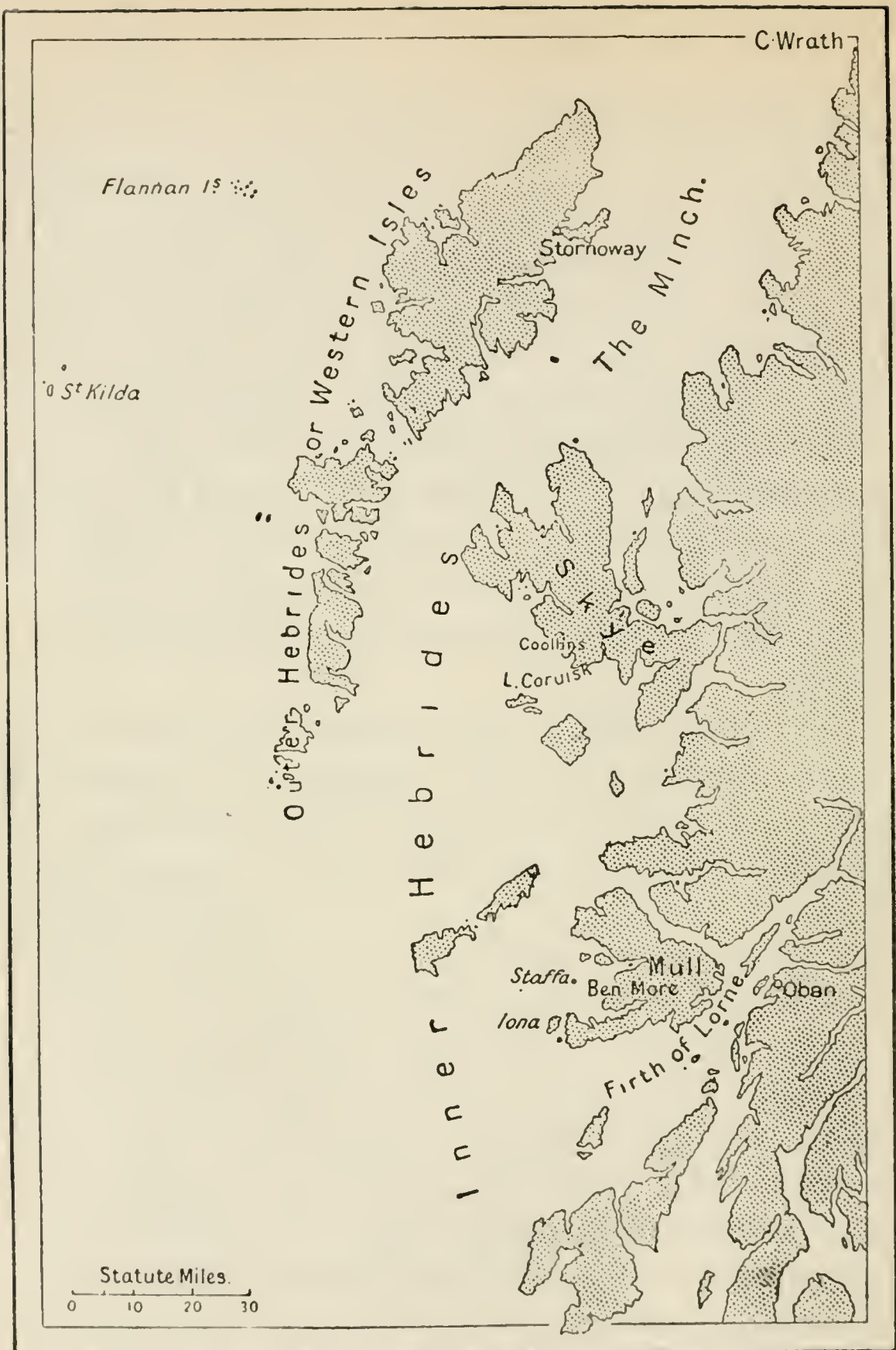
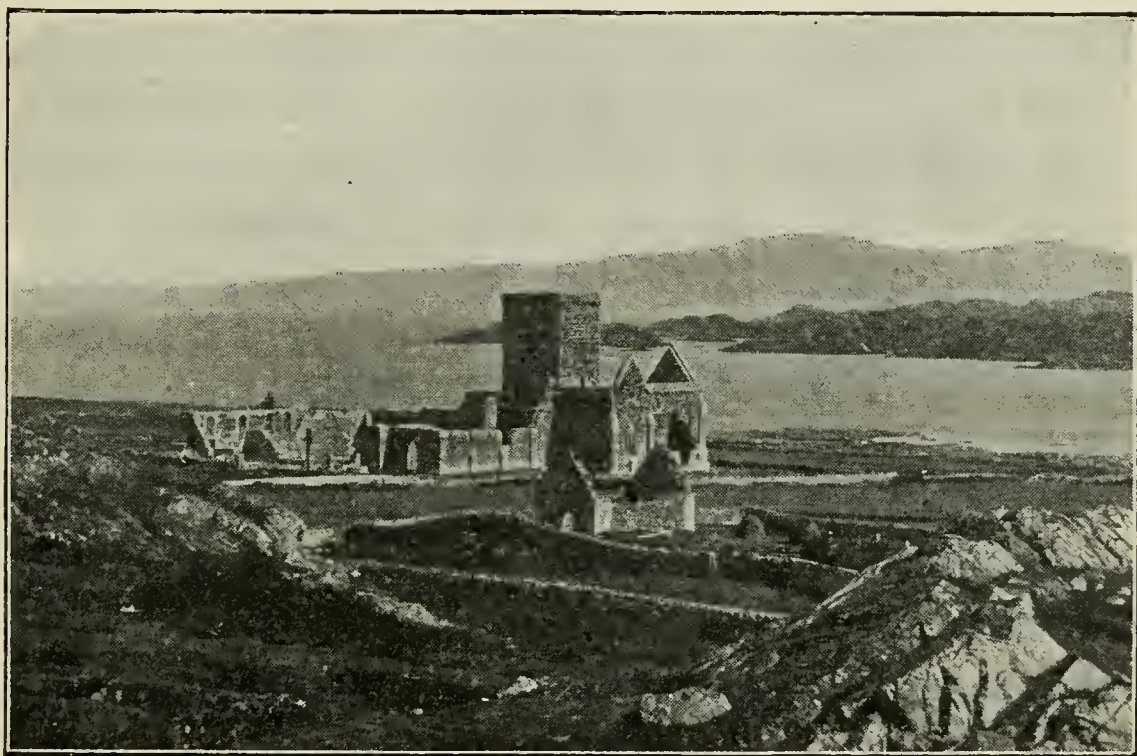


FIG. 53.—THE WESTERN ISLES.  
Measure the length of Long Island.

the great ocean to a height of seventy-five feet, with a circuit of only a hundred yards. It is one of the loneliest islets in the world. When seen from a distance it resembles a ship in full sail, for the upper part of the rock is vividly white and the lower is grey, like the hull of a vessel. Rockall



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FIG. 54.—THE RUINS OF IONA CATHEDRAL.

Across the Strait is the Island of Mull.

is visited at long intervals by ships engaged in the cod fishery.

Of all the western isles the deepest interest attaches to the small islet of Iona, placed in the midst of the Inner Hebrides, just where the Firth of Lorne makes an entry to Glenmore. Iona was



the home of Columba, the Irish monk who brought Christianity to Scotland. It has a most interesting ruined cathedral.

Iona has a position off the west coast not unlike that of Inverness on the east. Inverness is at the point where the way through Glenmore branches from the east coast road. In the same manner Iona is midway along the western sea, at the point where the Firth of Lorne and Glenmore branch to north-eastward. It was therefore a convenient centre for the missionary work of Columba. Two hundred years later the monastery which he founded was again and again burnt, and the monks slain, in the wild time when the Norse pirates were fighting with the Celtic clans.

## CHAPTER XIX. THE ANCIENT VOLCANOES OF BRITAIN

WE have all heard of the wonderful mountains called volcanoes. There are many of them in the distant parts of the earth, but fortunately for us none in the British Isles.

At the top of a volcano there is a great pit which is called the crater. In the bottom of the crater there is a hole, which goes down through the centre of the mountain far into the rocks beneath ; no one knows quite how far. We do know, however, that it goes down into depths of the earth which are very hot, because melted rock, shining like fire, wells up at times into the crater.

This liquid rock is called lava. Great jets of steam rise from its surface and hang like a storm cloud over the summit of the mountain. There are constant flashes of lightning, and at night the clouds reflect magnificently the glare from the crater below. Sometimes the lava boils over, and a great river of it flows down the side of the mountain, and over the neighbouring country, destroying everything which lies in its path.

Men have often described volcanoes as burning



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FIG. 55.—FUJIYAMA, A FAMOUS VOLCANO IN JAPAN, 12,000 FEET HIGH.

Note the conical shape of the mountain, and the broad top where is the crater,

mountains, but this is wrong, because the clouds are of steam and not of smoke, as they would be if the mountain were on fire.

In past ages of the world there were volcanic eruptions on a grander scale than in the present day. Great cracks

opened in the ground, and the lava poured out of them. It was so hot and so liquid that it did not pile up into a heap with a crater at the top, like the volcanic mountains of the present time, but drowned the whole country as though under a flood. Gradually the flood cooled and became a sheet of solid rock, covering the old surface of the land, filling the valleys, and in places driving out the sea.



You know that a piece of solid ice may be made by chilling water, and that it has a flat top, whatever the shape of the vessel in which it is contained. In the same way, by cooling liquid rock a hard mass would be formed with a level plain on its surface.

Now, although there are no volcanoes in the British Isles to-day, there is one part in which, before men came to live here, cracks of the kind just described opened in the rocks, and lava welled up and hardened in vast sheets several thousand feet deep and many miles wide. This district of Britain extends along the west side of Scotland into the north of Ireland.



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FIG. 56.—AN ERUPTION OF MOUNT PELÉ, A WEST INDIAN VOLCANO, SEEN FROM THE SEA.

The clouds of steam are several miles high.

The lava must have filled the Minch which, as you will remember, is the sea-channel between the Outer Hebrides and the northern Highlands. Thence it must have spread southward at least as far as Lough Neagh, the large lake which you will find in Plate X, p. 100, in the north-east of Ireland.

As you may see there, Lough Neagh lies almost due south of the Minch. If you want to learn how vast was the region covered by the liquid rock, you should measure on the map the distance from the Minch to Lough Neagh.

All this, however, happened long ages ago, and since then the fierce winds of the Atlantic have driven the storm waves for many thousands of years against the edge of the lava rocks. Their upper surface has been splintered by the winter frosts, and the rains have fed torrents, which have carried the rock fragments down into the sea. There they have settled on to the bottom of the ocean.

So it has come about that to-day the beds of lava, which were once piled up to so great a height and over so wide a space, have been reduced to mere fragments. Most of these fragments are now islands.

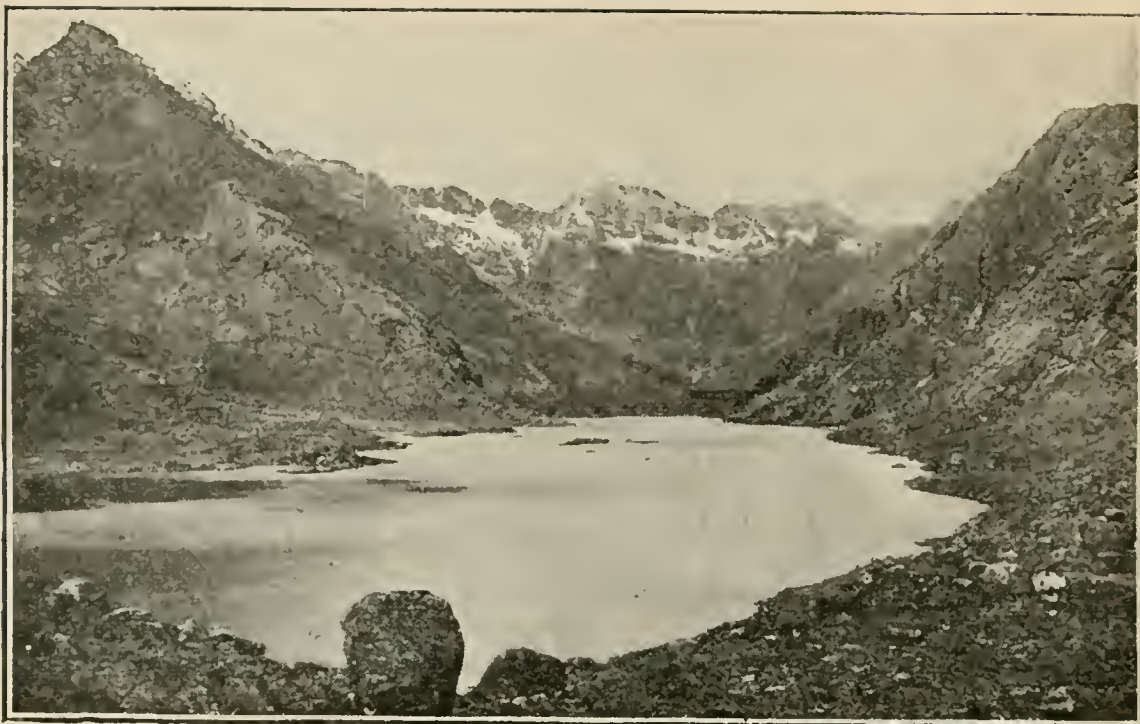
Look at your map again, and find on the west coast of Scotland the islands of Skye and Mull, which are the largest of the Inner Hebrides. The whole of the island of Mull, and nearly the whole

of the island of Skye are made of dark layers of heavy lava rock, of the kind which is called basalt.

The highest mountain of Mull is Ben More. This is, of course, a Gaelic name, like Glenmore and Strathmore, and it means "the great mountain." Ben More is over three thousand feet high, or as high as the highest points in the Lake District of England. Yet it is merely a vast pyramid of basalt, the beds lying one upon another like the courses of brick or stone in a wall. The pyramids of Egypt are of like shape, but of course they are smaller and were built by men.

The piece of basalt at the very top of Ben More is the last remnant of a great sheet of rock, which once extended like a level pavement for miles and miles in every direction. You must try to picture to yourself a solid plain of rock, above the present rolling sea, at a height of three thousand feet, or more than half a mile. And then try to think how the wind, and the rain, and the frost, and the waves have gradually pulled most of it down, so that there is left only a pointed heap. But the heap is so large that it is the mountain Ben More in the island of Mull.





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FIG. 57.—LOCH CORUIK. (Pronounced Coroosk.)

## CHAPTER XX. STAFFA AND THE GIANTS' CAUSEWAY

WE must not yet leave the Western Islands of Scotland, for there is more to learn of their beauty and of their wonderful story.

In Fig. 53, p. 112, on the south side of the island of Skye, you will find running into the land a firth which is called Loch Coruisk. The word loch is used in western Scotland not only for a fresh water lake, but also for a narrow arm of the sea.

The view in Loch Coruisk is perhaps the most sublime in all Britain, and in bad weather the sternest. The Coolin group of mountains towers from the shore into jagged peaks more than three thousand

feet in height. In other parts of Scotland there are higher mountains, but they generally rise from ground which is itself some height above sea level. The Coolins rise sheer from the water's edge.

Owing to the dampness of the Atlantic air their steep slopes are dark with moss and lichens. Hundreds of thin, silvery cascades leap down their sides and occasionally gleam in the sunshine.

The Coolins have an aspect very different from the level lines of the basaltic rock of Ben More in Mull. The volcanic rocks of which they are formed are of another kind, and are placed not in level layers, but on end, like knife-edges upstanding. The reason is that precisely over the spot where the Coolin Hills now rise, was once the



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FIG. 58.—THE COOLIN MOUNTAINS OF SKYE.



crater of a great volcano ; for you must learn that after the floods of lava, described in the last chapter, had cooled to solid plains, which were overgrown with vegetation, volcanoes of the ordinary mountain kind were here and there piled upon them. In the south of Skye, and in three or four other places along the west of Scotland, such mountains may have reached an elevation of ten thousand feet, or more than twice the height of the highest mountain now in Britain.

Long ages passed, and the activity of these volcanic mountains died down. The last of the liquid lava standing in the wide hole which came up into the bottom of the crater, cooled very slowly and became intensely hard. Then the frost and the rain and the wind got to work, and through long ages gradually pulled down the heap of lava which formed the mountain. So it happened that the core of intensely hard rock in the middle of the mountain was at last laid bare. And such a core, splintered by the weather into rocky spires, to-day forms the Coolin Mountains of Skye. Is it not wonderful to think that their topmost peaks were once liquid rock in a hole pierced through the ground ?

This marvellous history has gradually been learned on the spot by most careful examination of the rocks, carried out by scientific men known as geologists. It is their business to study the rocks of the earth, and to find out how they were piled up



and how they have been pulled down. If you look at a house, and see the bricks and the mortar of which it is made, you can picture to yourself the busy work of the builders. So the geologist examining the rocks of the earth, is able to picture the way in which they were built up and afterwards sculptured into beautiful scenery.

We have not even yet finished telling of the natural curiosities to be seen by the traveller in western Scotland and in north-eastern Ireland.

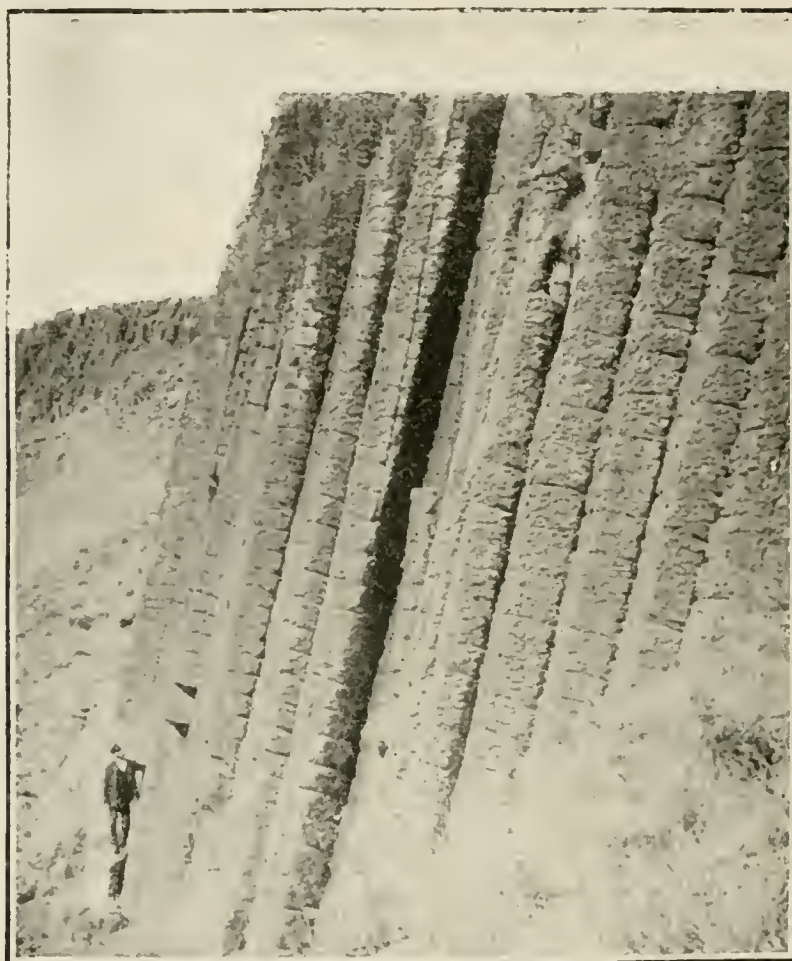
When mud dries in the sun along the edge of a shrinking pond, or along the banks of a river when the tide is out, it cracks in all directions. The cracks cross one another, so that the mud is divided into a number of slabs of irregular outline.

Now if you think of it, each of these slabs must be the top of a column of mud, because the cracks run downward into the mud. The whole mass, therefore, of the mud must consist of a large number of columns placed side by side. You could push the blade of a pocket knife into the cracks between them.

When the hot liquid lava cooled, it shrank and cracked, exactly as mud does when it dries in the heat of the sun. But the lava was so perfectly liquid, and so evenly mixed, that the cracks, instead of being irregular like those of mud, ran through it in straight lines, and divided it into nearly regular columns, each with six sides. Where the basalt has

been broken away by the waves and cut back into cliffs, you may often see these columns standing side by side, and tier above tier, over all the face of the cliffs.

There are two very celebrated places to which



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FIG. 59.—COLUMNAR BASALT.

tourists go in great numbers to see this wonderful natural architecture.

In the north-east of Ireland there is a spot on the coast, in the county of Antrim, which is called the Giants' Causeway. The word Causeway means





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FIG. 60.—THE GIANTS' CAUSEWAY.

a pavement raised a little above the ground so as to give a dry path. In the Giants' Causeway the tops of the basaltic columns form such a pavement beside the sea. Because the whole scene is on the grandest scale, and the people of Ireland have many stories of ancient giants, therefore this spot has been called the Giants' Causeway.

Even more wonderful is the islet of Staffa, which rises out of the sea just to the west of Mull. The waves have broken great caverns into its columnar



basaltic cliffs. Most famous of these is the Cave of Fingal, which can only be reached in a boat. It is walled on each side by columns supporting a ceiling of rock. It is over a hundred and twenty yards long. Above, in twilight gloom, it is like a great temple built by hands, but at high tide it is flooded with water, through which the echoing breakers surge to the very head.

The Gaelic name for the spot means the Cave of Music, because the roar of the ocean surf, driving into the cavern, resounds with the changing tones of a great organ.



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FIG. 61.—FINGAL'S CAVE, STAFFA.

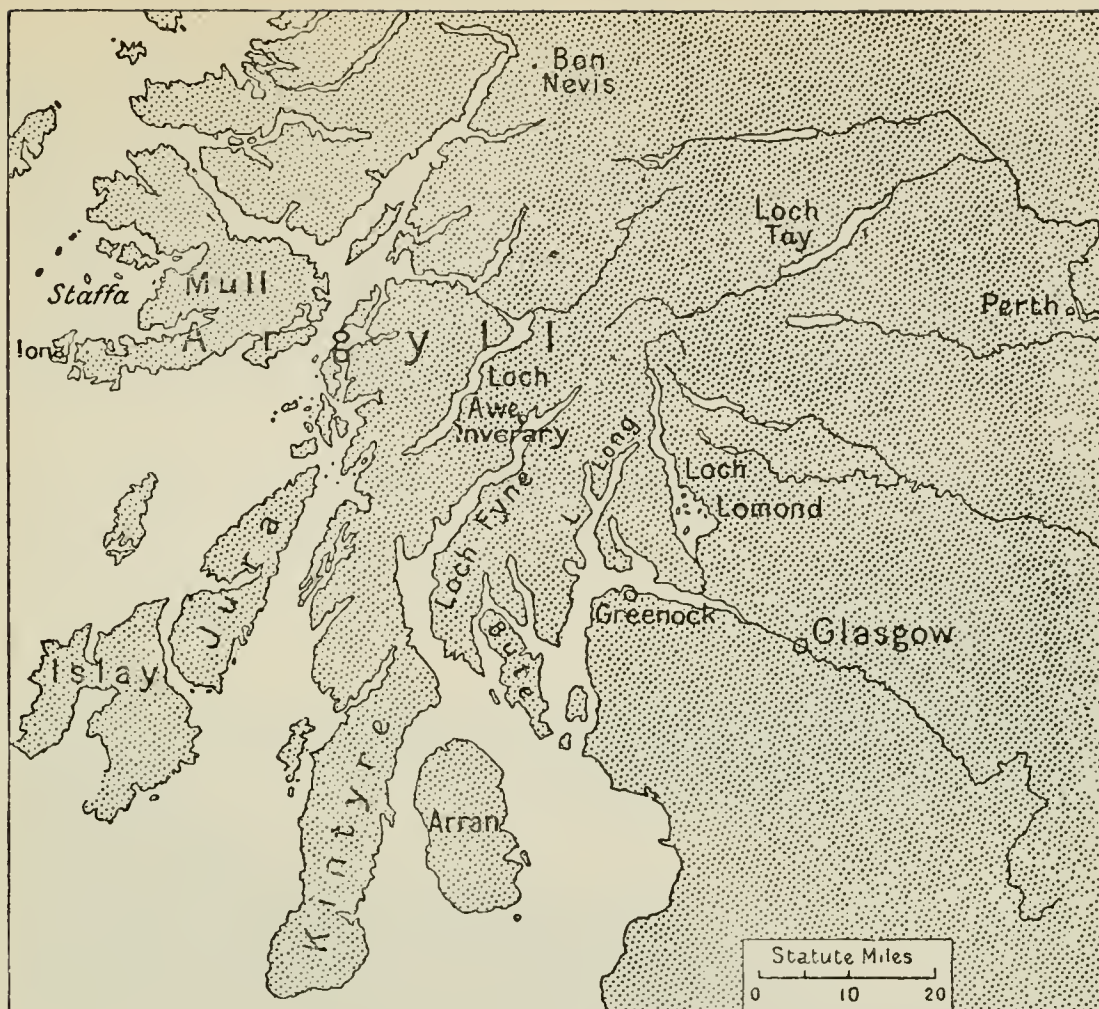


FIG. 62.—ARGYLL.

Compare Plate VII, p. 84.

## CHAPTER XXI. THE LOCHS OF ARGYLL

A GLANCE at the map will tell you that the large county of Argyll in the south-western Highlands must be a very interesting and very beautiful place. It has many high mountains, although the highest mountain in the British Isles, Ben Nevis, stands just outside Argyll, in the county of Inverness. Ben Nevis measures 4,600 feet, or not very far short of a mile high.



Argyll, however, is not only mountainous, but has long, narrow lakes in its glens, and is pierced by long, narrow arms of the sea. Compare it (on Plate VII) with the promontory of Buchan on the other side of Scotland. See how unbroken is the coast line of that part, and how the inland districts



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FIG. 63.—LOCH AILORT, A SEA-LOCH.

Another sea-loch is shown in Fig. 70, p. 144.

are almost devoid of lakes. It is only when we have come quite half way across Scotland that we begin to find lakes.

The water parting of the Grampian Highlands runs southward along the boundary between the counties of Perthshire and Argyll. It follows some



high ground, which is called in Celtic Drumalban. This means the backbone or ridge of the ancient kingdom of Alban or Albany, which lay in the Highlands of Scotland.

Drumalban is something like the Pennine Range of the north of England, for it divides the eastward from the westward drainage. But there are high mountains in the country to east and west, higher than Drumalban itself, whereas on either side of the Pennines are the plains of Yorkshire and Lancashire.

We note on the map long lakes, such as Loch Tay, in the glens which drain north-eastward from Drumalban towards the North Sea. There are others, such as Loch Lomond, in the south-eastward glens, and yet others, such as Loch Awe, in the glens which drain south-westward to the Atlantic. Long narrow arms of the sea run north-eastward far into the land of Argyll between the last, the south-westward group of lakes. These sea-lochs as they are called, such as Loch Fyne and Loch Long, are precisely like the freshwater lochs, except that they are part of the ocean.

The fact is that owing to the great rainfall of western Scotland the torrents have worn the whole land into a number of sharp mountain ridges, with glens between them. Some of these glens have fresh water lochs in them and some have sea-lochs. In the eastern Highlands the glens lie further



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FIG. 64.—GOSTEDAL GLACIER IN NORWAY.

apart, and the moors between are broad and rounded.

Have you not observed that after heavy rain the streams flow with muddy water? They are digging their beds deeper, and are carrying the mud down to the sea. That is how the deep glens have been made in the rainy west of Scotland.

You remember that Lancashire has more rain than Yorkshire. Let us turn back to Chapter XI, and refresh our memories as to the reason why. The west of all Great Britain is more rainy than the east.

But Argyll is moister than Lancashire, because the Grampians are higher than the Pennines, and

also because the Irish mountains take some of the moisture from the west Atlantic wind before it reaches Lancashire. If you look at the map, you will see that Ireland does not lie to the west of Argyll.

In the course of long, long ages Argyll has sunk a little, though very, very slowly, and the sea has run up some of the glens, and in some places has entered the lower ends of the lochs, and so turned them into sea-lochs. Therefore we describe Argyll as a half-drowned country.

It is for this reason that the promontory of Kintyre, and the island pairs of Islay and Jura, and Bute and Arran, stand out towards Ireland, side



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FIG. 65.—SVARTISEN GLACIER IN NORWAY.

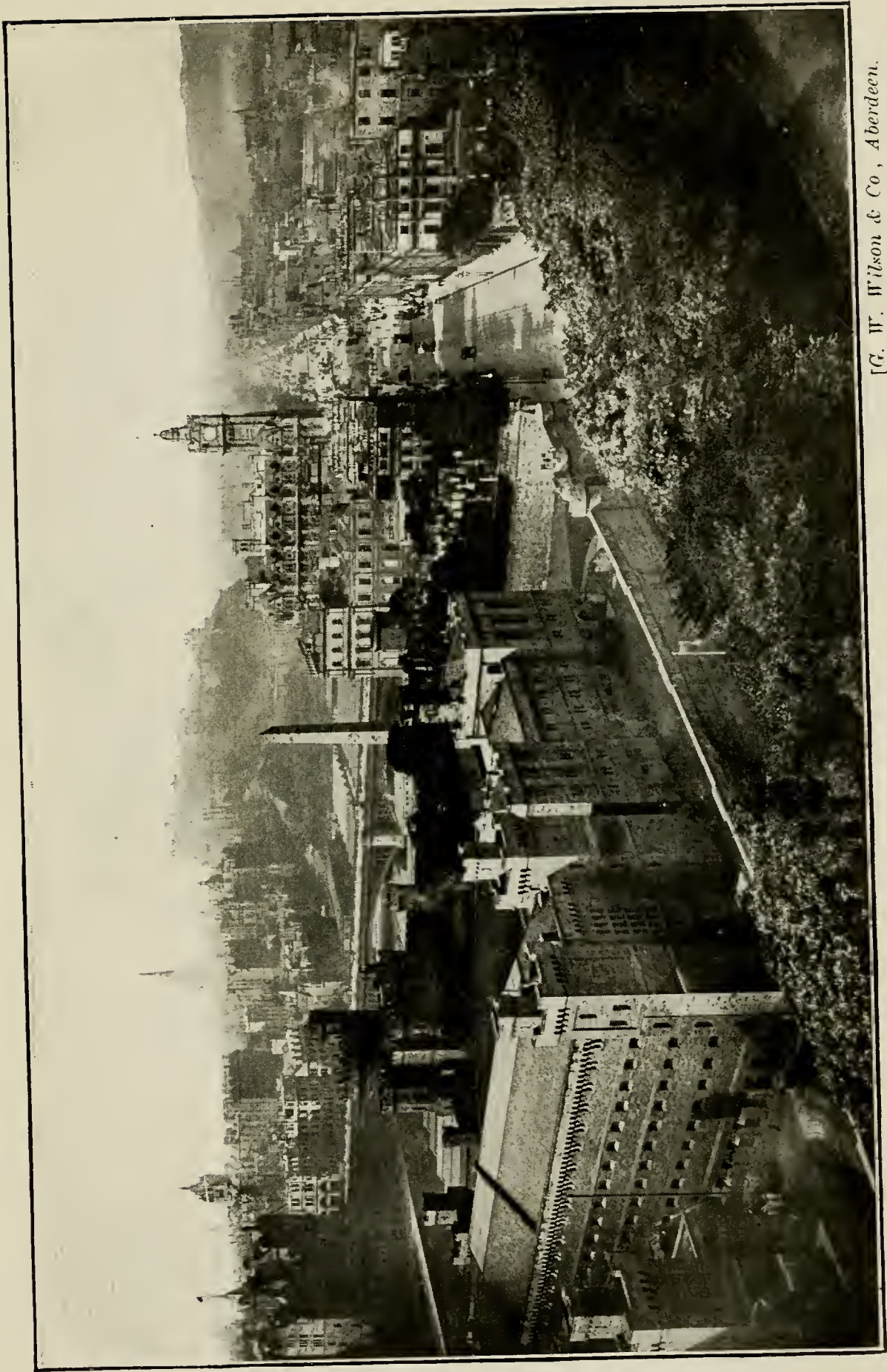


by side, in three chains. Once they were three ridges of mountain with glens between them. Now the glens have been flooded by the sea. Find Kintyre and the four islands on the maps, and make quite sure that you understand what the last three sentences mean.

There was once a time, now long gone by—for it was before the beginning of written history—when the glens and lochs of Argyll, which had already been worn deep by the torrents, were filled with ice. The climate of Britain was then much colder, and the moisture from the Atlantic gathered on the moors, winter and summer, in deep snow, which never completely thawed. Pressing together, the snow became ice, which slipped down the glens like so many ice rivers, or, as they are called, glaciers.

These glaciers carried many stones. If you turn up the turf in some parts of Scotland, you will find that the rock underneath is scratched all over. This was done by the stones which were borne along embedded in the sides of the ancient ice rivers.

Have you ever noticed a glazier cutting glass? He scratches it with a hard diamond which he carries on the end of a holder shaped like a pencil. Then he breaks the glass along the scratch. Just in the same way the glaciers, in whose icy sides hard bits of stone often got wedged, scratched the rocky beds of the glens down which they travelled.

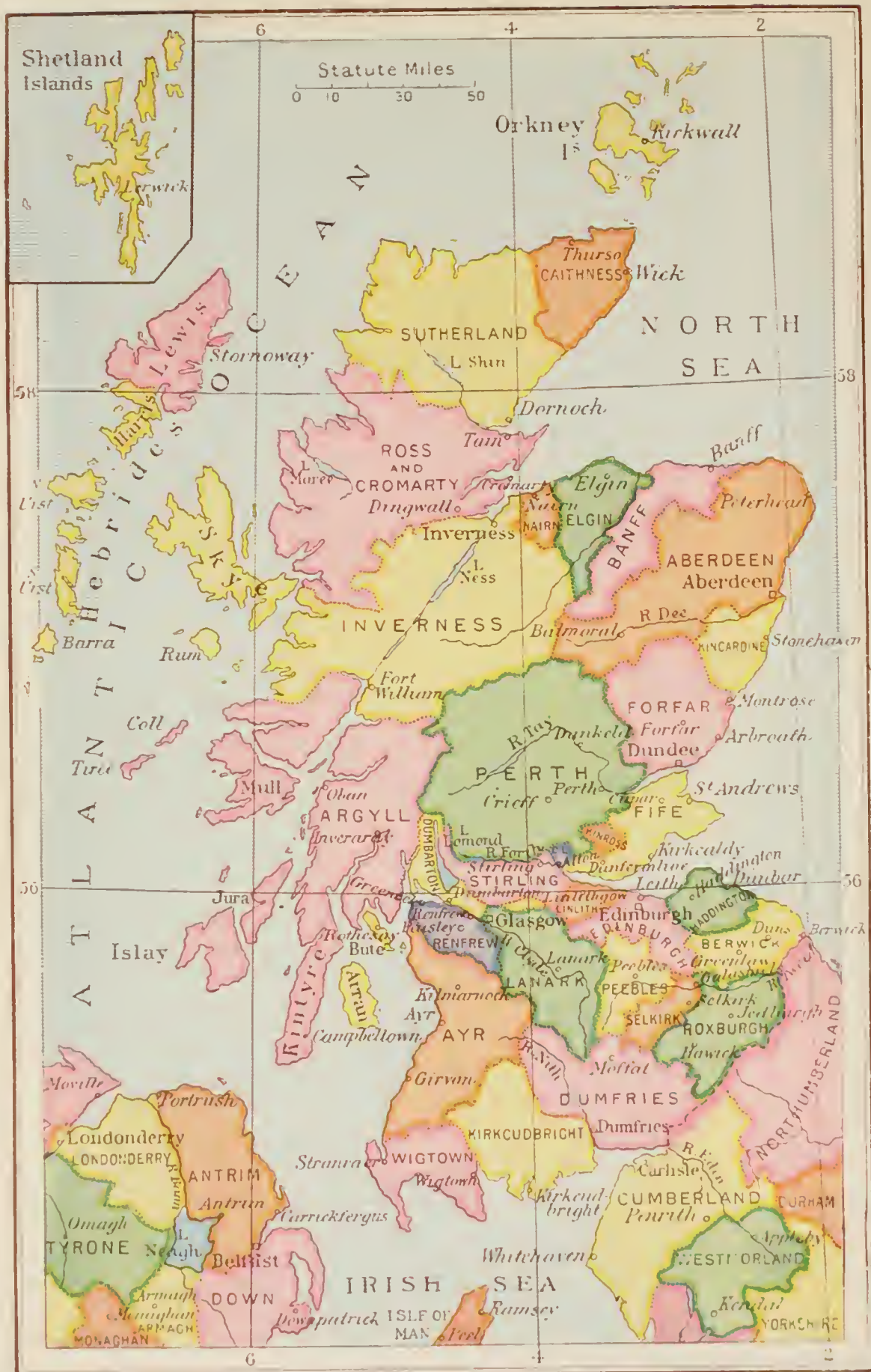


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XI. VIEW OF EDINBURGH

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## XII. SCOTLAND, POLITICAL.





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*[R. Kidston, Esq., F.R.S.*

FIG. 66.—ROCK AT STIRLING SMOOTHED AND SCRATCHED BY ICE.

We have now finished the description of the Western Highlands. The story of them is indeed very wonderful. Think first of the floods of hot flowing rock that filled the seas off the west of Scotland. Think secondly of this rock when it had chilled and hardened and had formed the columns of which Mull and Staffa are built. Holes were next burst through by steam from the hot parts of the earth below. Through each of these holes fluid rock welled up, and piled a mountain around the mouth of the hole. Slowly the weather ground the hardened rocks into valleys and islands, and the volcanic ruins are now the Coolin Hills of Skye.

Then think of all Scotland white and cold, and

of the ice rivers, the glaciers, which filled the western glens and pushed out to sea, there to break off piece by piece, and to float away on the ocean as great icebergs. There are no icebergs now in the British seas.

A new change came, and the west of Scotland, slowly sinking, allowed the sea to flow into the



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FIG. 67.—AN ICEBERG.

valleys between the mountains of Argyll and the Western Isles, making the present maze of straits and sea-lochs. The rate of the sinking was very likely only two or three inches in a man's lifetime.

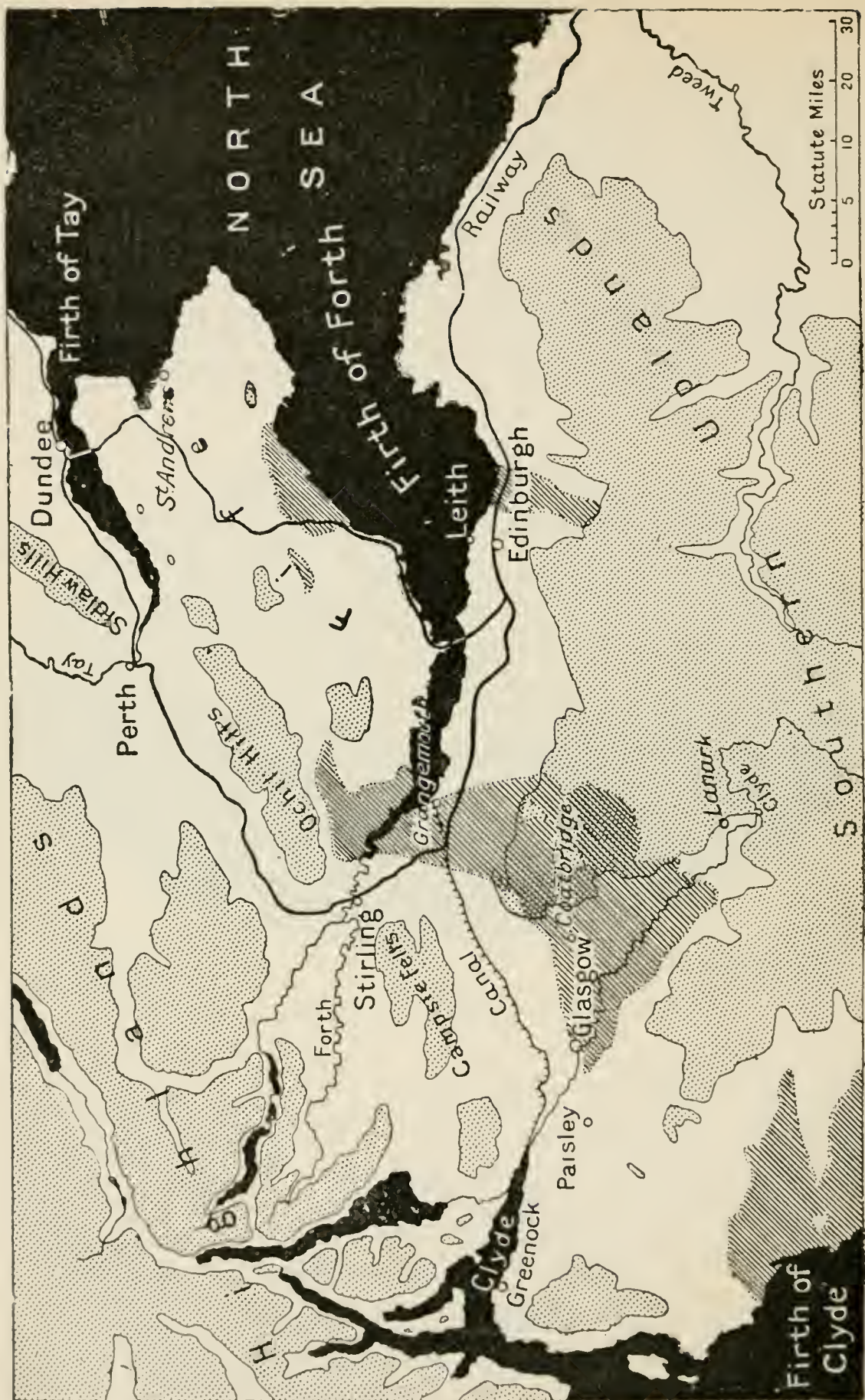
At last, after all these ages, came the wild Highland clans to live in the glens, while the Norse pirates raided cruelly along the coasts.

Finally, not much more than a hundred and fifty years ago, in the time of your grandfather's great-grandfather, the Highlanders were reduced to order, and roads were made through the glens.

In our own time railways have been constructed, and the Highlands have become the resort of tourists and sportsmen from the richer countries of Southern Scotland and England.







 Coal Fields  
 Land over 600 feet.  
 FIG. 68.—THE CENTRAL LOWLANDS OF SCOTLAND.

## CHAPTER XXII. THE BUSY HEART OF SCOTLAND

BETWEEN the two great slabs of high ground, which we have now learned to know as the Southern Uplands and the Highlands, there is a trough of low country which crosses Scotland diagonally, from the south-west to the north-east coast. Although this lowland is less than a quarter the size of all Scotland, yet it contains nine-tenths of the population (Plates VI, p. 69, and VII, p. 84).

The ground is here formed of softer material than in the Highlands and Southern Uplands, so that the rains and streams have worn it down to a lower level, and have carried much of its substance into the seas on either hand. The soft surface breaks up into a fertile soil, which is no longer washed away so easily, because the ground is now low and the streams flow more slowly. The climate also is milder than on the high ground, and the position under the shadow of the mountains is well sheltered.

This, therefore, is the district of Scotland in which there is most agriculture. The market towns have here in consequence always been numerous and considerable, just as in the Vale of York.



The rivers descend into the Central Lowland from the heights to north and south. On the one hand the Tay and the Forth come out of the Highlands, and, crossing the lower agricultural ground, empty themselves into the North Sea. On the other hand the Clyde flows north-westward from the Southern Uplands, completely across the Central Lowland, to find an exit in the western ocean.

The portions of these rivers which lie within the Lowland are tidal, and the Central Lowland of Scotland is therefore not only fertile, but also very accessible to shipping from the sea. Large vessels go up the Clyde to Glasgow, and there is a canal for smaller vessels from Glasgow to the Forth. You might measure the length of this canal. It enters the Forth at Grangemouth.

The most striking fact, however, about the Central Lowland is that it is not only an agricultural district, but that it also possesses coalfields. Therefore the Scottish mills and factories are mostly here.

You will remember that in the north of England much of the coal lies high in the shoulders of the Pennine Moorlands, so that many of the factories stand in bleak positions above the farming country. In Scotland, on the other hand, nearly all the coal is beneath the Central Lowland, not in the Highlands and the Southern Uplands. It has thus come about that the best agriculture and the chief manu-



factures are in the same part of Scotland, but in England they are in different parts.

The two great cities of Edinburgh and Glasgow have grown up side by side, only forty miles apart, in the centre of Scotland. Stirling and Perth are ancient towns placed, as we have already seen, where the east coast road crosses the Forth and the Tay, just at the points where these rivers begin to widen into their estuaries or firths.

Dundee and Aberdeen, the third and fourth cities of Scotland, are ports supplying the needs of the fertile strip of low country which, as we have learnt, extends northward from the Central Lowland along the east coast. Between Glasgow and Edinburgh, and also to the south-west of Glasgow, have sprung up many modern manufacturing towns. Of these Paisley and Coatbridge are the largest.

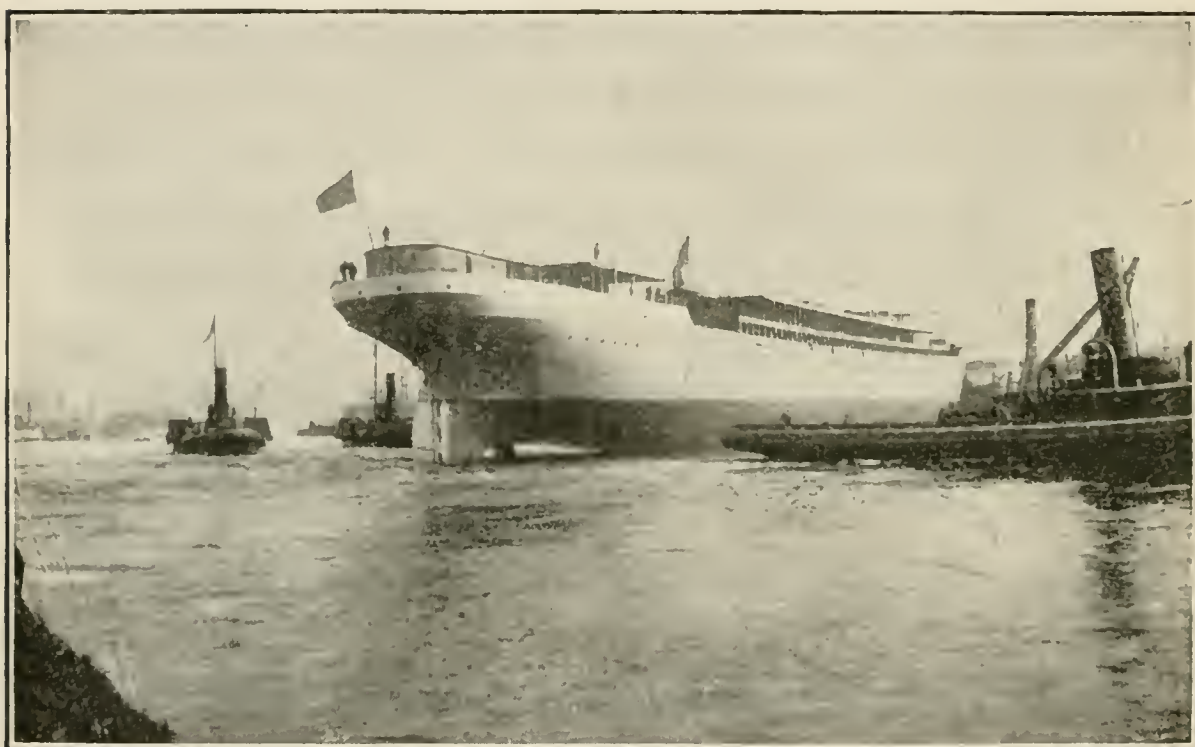
Glasgow is now twice as large as Edinburgh, even if you include with the latter the port of Leith. Indeed, Glasgow is now second only to London in point of size among the cities of Britain. With its suburbs, it has not far from a million people, or more than a fifth of the population of Scotland.

Glasgow is like Liverpool, Manchester, and Birmingham combined, for it is a port like Liverpool, it makes woven goods like Manchester, and it manufactures steel like Birmingham.

On the banks of the Clyde below Glasgow are

very large shipbuilding yards. Ships used to be built of wood, but now they are made of steel. Therefore an estuary which runs up into a coalfield where there is also iron, is the best place for modern shipbuilding.

Edinburgh is, however, the historic capital of



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FIG. 69.—THE LAUNCH OF A SHIP ON THE CLYDE.

Scotland. Here sit the chief judges of the northern kingdom, and formerly the Scottish Parliament assembled and the Scottish king resided here.

Edinburgh is a very beautiful city with an old castle standing on a rocky crag like that of Stirling (See Plate XI, p. 132). Being on the eastern side of the island, it is not so wet a place as Glasgow, and

having much smaller industries, it is less darkened with smoke.

Let us look at the map in some book of Railway Time-tables. There we shall see that the centre of Scotland, near Glasgow and Edinburgh, has a close network of railways. A number of lines extend also south-westward to the coalfield of Ayrshire, and others run along the fertile strip north-eastward to Aberdeen and Buchan. Elsewhere there are but few railways in Scotland, because the population in the higher parts is so sparse that they would not pay.



## CHAPTER XXIII. THE SCOTTISH COUNTIES

SCOTLAND is divided into thirty-three counties. If we compare Plate XII, p. 133, with Plates VI, p. 69, and VII, p. 84, we may learn some interesting facts about them.

Let us start from the north. There we see the county of Orkney, containing two groups of islands, the Orkneys and the Shetlands. Next we come to the small county of Caithness, which is the low-lying end of one of the two great eastward promontories of Scotland. Although it is but a small county, it has a larger population than the broad county of Sutherland, which adjoins it. This is the natural consequence of its lower level, its softer climate, and its better cultivation.

The three large counties of Sutherland, Ross, and Inverness spread northward, westward, and southward, from the head of Moray Firth. Ross and Inverness extend even to the Hebrides. The three chief towns, Dornoch, Tain, and Inverness, stand on the east coast upon the narrow plain of agricultural land. Elsewhere in these high, barren counties there is nothing larger than a village.

Then we come to a series of five counties ranged along the east coast round the second of the eastward promontories of Scotland. Their county towns, Nairn, Elgin, Banff, Aberdeen, and Stonehaven, are placed, as we may learn from the maps, in the coastal lowland of the east.

The counties of Forfar and Perth also have their county towns outside the mountains, although not upon the coast, for the towns of Forfar and Perth stand in the fertile strip of Strathmore, through which the east coast road is carried to avoid the Firths of Tay and Forth.

Thus we have no less than eleven Highland counties ranged along the east coast, in each case with the county town outside the mountains, and therefore easily accessible by road from Edinburgh.

Only two more Highland counties remain, Argyll and Bute. The latter consists of the islands of Bute and Arran, and, being wholly insular, may be compared to the county of Orkney.

Argyll, as we have seen, consists of the group of peninsulas and islands north of the Firth of Clyde. It was the home of the powerful Campbell clan, who were usually at enmity with the clans of the northern and eastern Highlands. The Duke of Argyll, who lives at Inverary, the county town of Argyll, is the chief of the Campbells. Near the end of the peninsula of Kintyre you will find a place called Campbeltown.

The counties of the south of Scotland are, on the average, smaller, but far more populous than those of the Highlands. On the east coast, the county of Fife occupies the peninsula between the Firths of Tay and Forth. On its border towards Perthshire are two curiously small counties, Kinross and Clackmannan.



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FIG. 70.—LOCH FYNE, A SEA-LOCH, AND INVERARY CASTLE.

West of Fifeshire, the two counties of Stirling and Dumbarton share the space of lowland between the Forth and the Clyde. Each of them sends a tongue up into the Highlands, the one to the east and the other to the west of Loch Lomond.

The remaining counties of Scotland are ranged



along the chief valleys, or beside the coasts. There are four groups of them.

Along the southern shore of the Firth of Forth is the country of Lothian, divided into the three counties of Linlithgow, Edinburgh, and Haddington, which are also known as West Lothian, Mid Lothian, and East Lothian.

South of Lothian are the four counties of Peebles, Selkirk, Roxburgh, and Berwick, which together, although not quite exactly, occupy the basin of the Tweed, just as the county of Yorkshire in England nearly agrees with the basin of the Ouse. You remember, of course, that the town of Berwick was long ago taken by England from the county of Berwick.

Then we have the two counties of Lanark and Renfrew, formed very nearly by the basin of the Clyde. They are densely peopled because of their coal.

Lastly, we have the promontory which runs out into Galloway in the south-western corner of Scotland. The west coast here belongs to Ayrshire, but the south coast, along the Irish Sea, is divided between three counties, Dumfries, Kirkcudbright, and Wigtown.

If we now run over the counties of Scotland again, we shall find that nearly every county town is placed either on or near the coast, or else upon an important river. Thus we learn that when the

counties were formed men travelled about chiefly by water, and the most important towns were placed near the water-ways. This is surely natural in a mountainous land where road making was very difficult.

We know that the counties were formed when the towns had already grown up, because most of them are named, just as in the north of England, after their county towns. But the county town is not now always the largest place in the county. Glasgow, for example, has grown to be very much larger than Lanark, the county town of Lanarkshire, in which Glasgow is situated.

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Now we will cross over to Ireland. We will ask for a book of Railway Time-tables, in order to find out a good train from Glasgow to Belfast, or from London to Dublin, and let us note on the map which of the sea-passages we take.

## CHAPTER XXIV. IRELAND AND SCOTLAND

IRELAND and Scotland are in some ways very like, and in other ways very unlike. Let us examine them upon the maps, and see how they resemble one another and how they differ (see Fig. 71., p. 148).

The first thing, of course, which strikes you is that Ireland is a separate island, but that Scotland is a peninsula attached to England by an isthmus. This difference between the two countries is important, because you can travel by railway from England to Scotland, whereas the sea must always be crossed in going to Ireland, unless some day a tunnel should be made under the North Channel between Scotland and Ireland. You will remember that the North Channel is the narrowest part of the sea separating Ireland from Great Britain.

Let us next compare the two countries in respect of size. Examine the scales of the two maps carefully by measuring them with a piece of paper. If you find that a hundred miles of country is shown by the same length of paper on both maps, then you may measure the length of Scotland against that of Ireland. But if the scales are not



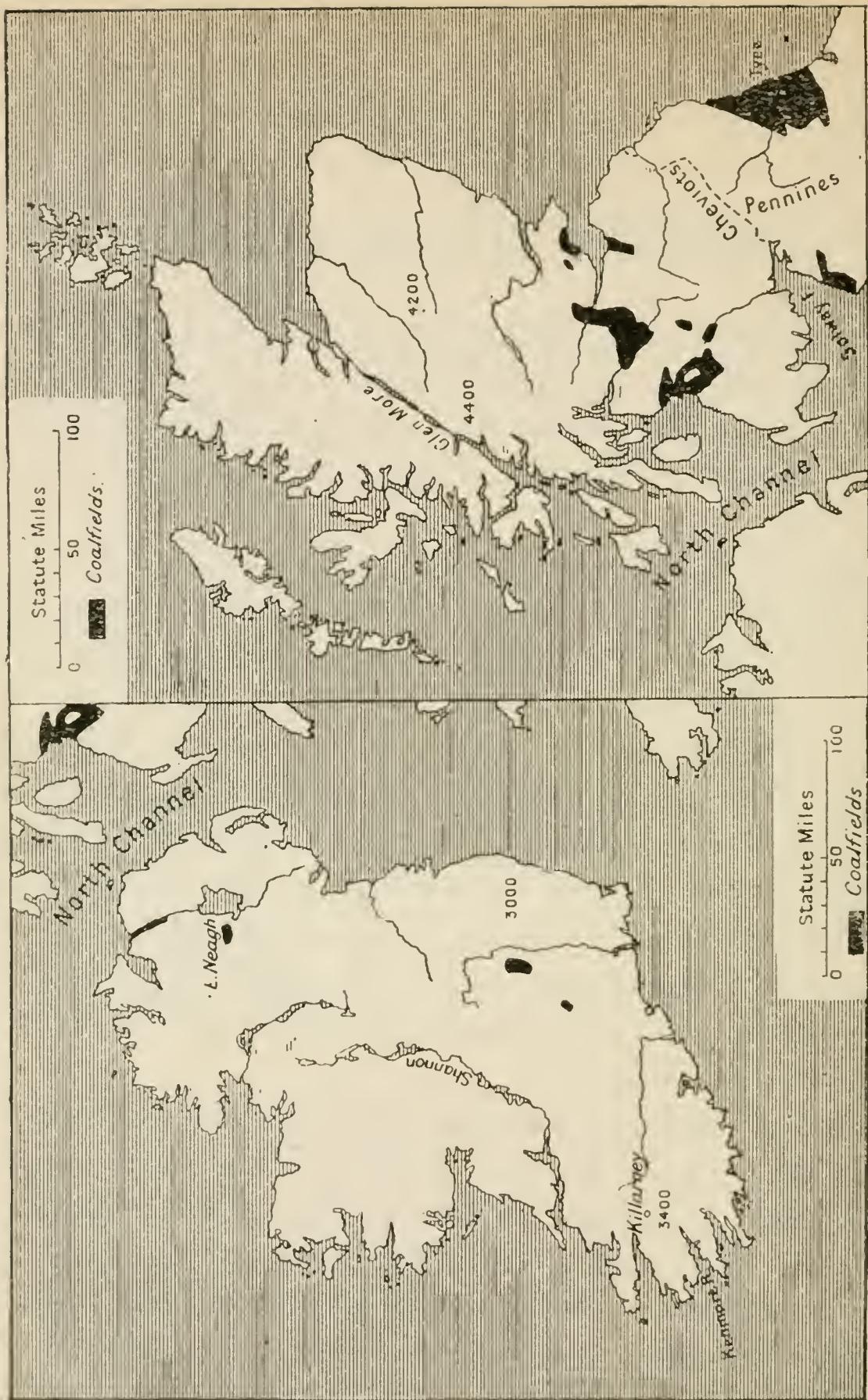


FIG. 71.—IRELAND AND SCOTLAND.

alike, then you must measure out each country according to the scale of its own map, in the way that we learnt in the First Part of this book.

We shall find that Scotland is longer than Ireland, but we must bear in mind that Ireland is more rounded and compact in outline, for the sea sends firths and lochs far into the midst of Scotland. Although it is the longer, Scotland contains a little less land than Ireland. For practical purposes, however, we may think of them as alike in size.

Now let us compare them in respect of height. First we notice the numbers on the two maps which give the heights in feet of the highest mountains. In Scotland these are a little more than 4,000 feet, whereas in Ireland they are a little less than 4,000 feet. Although the highest points of Scotland are thus a little higher than those of Ireland, yet the difference is not very great, and we may speak of both countries as mountainous.

But it is not enough merely to consider the highest points. A country may be generally low, and yet may contain a few very high mountains. Look at the map of Scotland on Plate X, p. 100. About half of it is printed brown, and this means, as you learn by looking at the index in the corner of the map, that it is half covered with ground more than 600 feet above the sea level. In other words, Scotland is generally a high country, with



lowlands only in the centre and along some parts of the coast.

The map of Ireland, on the other hand, which you will find on the same plate, shows that most of that country is lower than 600 feet, and only here and there do we see patches of higher ground.

If the sea were to rise 600 feet above its present level, it would everywhere flood the lowlands, and only the higher grounds would rise as islands above its surface. The Northern Highlands and the Grampian Highlands of Scotland would each be a fairly large island. Between them there would flow a long narrow strait, where is now Glen More. South of the Grampian Island would be a broad channel, with some small hilly islands, where is now the populous central lowland of Scotland.

South of this again would be a chain of three large islands. The first would consist of the Southern Scottish Uplands and the Cheviots. The second would consist of the North Pennine Moors and the Lake Mountains, because these two are joined, as we saw, by Shap Fell, which is more than 600 feet high. The third would be the South Pennine Moorland ending in the Peak of Derbyshire. These three islands would be divided by narrow straits, where are the Tyne and the Aire Gaps.

Now turn to Ireland on the same map (Plate





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[R. Welch.

FIG. 72.—MOUNTAINS RISING ABRUPTLY FROM AN IRISH PLAIN.

Note the peat-bog in the foreground, with the stumps of ancient trees.

X). You will see that, if flooded to a depth of 600 feet, Ireland would not be reduced to a few large islands, but would become a scattered group of small islands. In other words, it is in the main a low-lying country, but is studded with mountains, which rise steeply into peaks nearly as high as the broad rolling moors of Scotland.

Let us next consider how the population is settled in the two lands. We saw that in Scotland nine-tenths of the people were gathered into the small central lowland, and for two reasons. In the first place, neither the Southern Uplands nor

the Highlands are well fitted for agriculture, for they are too bleak and sterile. In the second place, they do not contain the coalfields, and therefore lack the large industries of the centre.

In Ireland, on the other hand, the broad lowlands give opportunities for farming in most parts, so that the population is scattered evenly over the whole country. The map shows that there are only a few coalfields, and these do not produce the best coal (Fig. 71). Therefore, except at the seaports, where coal is imported by ships from Great Britain, the Irish manufacture little, and as a consequence have few large towns.

There are rather fewer people in Ireland than in Scotland, but the difference is not great, and you may think of each country as having between four and five million people. But Glasgow, the largest town in Scotland, is two or three times as large as Belfast, the largest town in Ireland ; and Edinburgh, the capital of Scotland, is larger than Dublin, the capital of Ireland. Most of the Irish are farmers and labourers in the country.

We may add one other likeness between Ireland and Scotland. In both countries two languages are spoken. In all the east of Ireland, and in all the south and east of Scotland, the mother tongue of the people is English, but in the north-west of Scotland and in the west of Ireland it is Celtic.

The Celtic language spoken in Scotland is



nearly, but not quite, the same as that spoken in Ireland. For instance, the word for lake is "loch" in Scotland and "lough" in Ireland. You write Loch Lomond, but Lough Neagh. Most of the people, however, in both countries speak English. Even those whose mother tongue is Celtic can now for the most part speak English as a second language.

Let us sum up the points in which Ireland and Scotland are alike, and those in which they differ.

1. The two countries are of nearly the same size, but one is an island of rounded outline, and the other a peninsula of jagged outline. Scotland is therefore much better fitted for commerce, because ships can go far inland, and railway trains can enter from England. On the other hand, it has been very costly to make railways in the Highlands.

2. Scotland is a high country with only small lowlands, but these lowlands are good for agriculture, and also contain coal. Ireland, on the other hand, is a low country in general, although it has high mountains in parts. As a whole it is better fitted for agriculture than is Scotland, but it lacks coal. Therefore, although the populations of the two countries are nearly equal, the Scottish population is chiefly gathered into a small part of Scotland, while the Irish people are scattered nearly equally over all Ireland.



3. Although Ireland and Scotland each have Celtic-speaking people along the Atlantic coast, yet in both lands those parts which are nearest to England contain an English-speaking population

## CHAPTER XXV. THE LONGEST OF BRITISH RIVERS

ON the map of Ireland on Plate XIII, p. 162, find the position of Dublin. For about fifty miles northward of Dublin, the coast is low, for the land is coloured green on the map. You will note that the green extends unbrokenly westward, very nearly to the Atlantic. Along the western shore, however, some strips of brown indicate a rocky barrier. High mountains there separate the lowland from the waves of the ocean.

It would be well to measure upon the map the length and breadth of this Central Plain of Ireland. Eastward, as we have just seen, it ends on the coast, but northward, westward, and southward at the foot of the mountains. Among the northern and southern mountains are many smaller strips of plain.

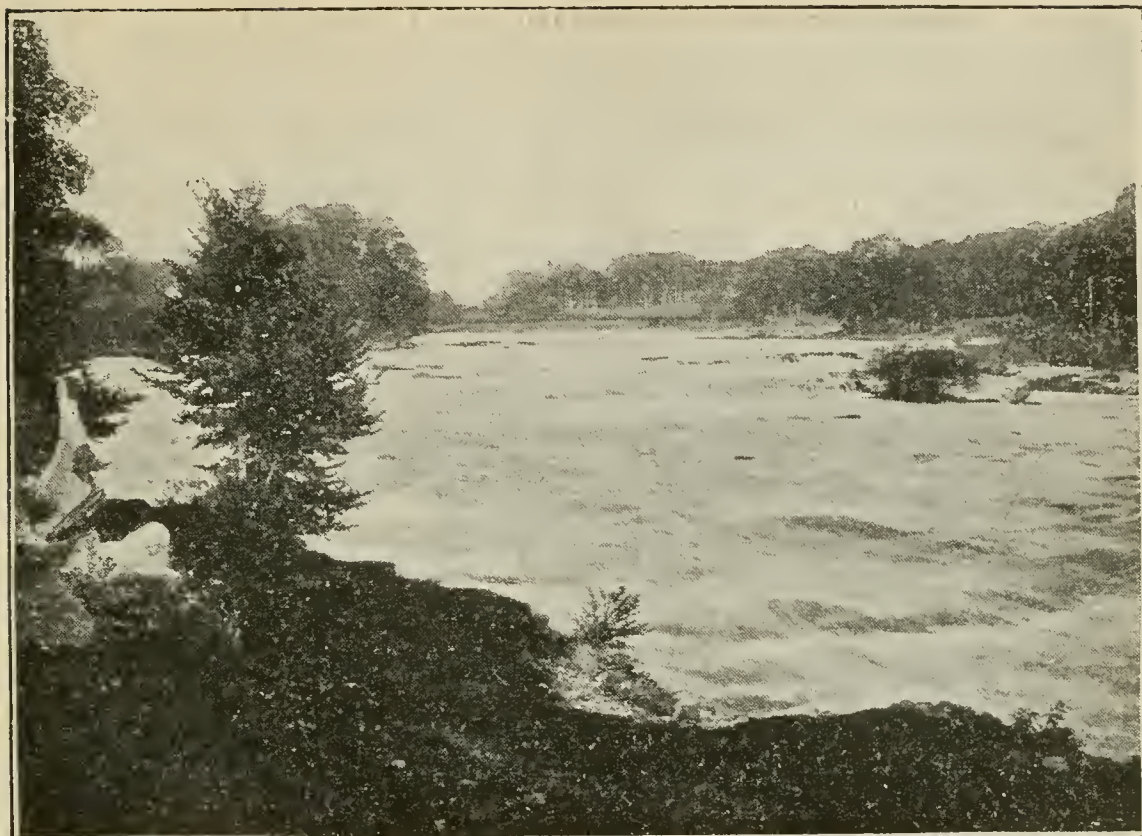
The Shannon, the longest river in the British Islands, flows from north to south completely across the central plain. It rises in the northern mountains, but enters the sea through an opening



FIG. 73.—THE BASIN OF THE SHANNON.

Note to what extent the West of Ireland would be drowned if the sea were to rise 600 feet.





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[W. Lawrence.

FIG. 74.—THE FALLS OF THE SHANNON AT CASTLE CONNELL.

in the southern mountains. At this opening, at Castle Connell, the mountains rise to right and left of the river, and there is a rocky impediment in its bed, over which the water bounds in a cascade known as the Leap of Doonas. The Falls of the Shannon are not high, but they are impressive, because of the great volume of water which comes over them. In Plate XIII mark the position of Castle Connell.

The course of the Shannon is divided into two parts by the Falls. Above, the river glides very slowly through the plain, and spreads out into a

series of large lakes, in which are beautiful wooded islands.

These lakes are very different from the lakes of Scotland and of the north of England, for they have low banks. They are merely flooded portions of the plain, whereas the lakes of Scotland and of the north of England lie in valley bottoms between high mountains. As the map will show you, a great part of the course of the Shannon through the plain is, in fact, a chain of lakes, and it is not in all parts easy to find a place for a bridge.

The chief bridge is at Athlone, almost exactly in the centre of Ireland. Here there is a great cattle market, and the cattle are shipped down the Shannon, being taken past the Falls by a canal.

Below the Falls, the Shannon forms a magnificent estuary, more than sixty miles long, at the head of which is the seaport of Limerick. Most of the trade, however, of Ireland is done with Great Britain, so that it is unfortunate that the mouth of the Shannon turns westward and not eastward, because ships from Limerick have to go completely round the south of Ireland on their way to England.

Ireland is divided not only into counties, like England and Scotland, but also into four provinces, which were once independent kingdoms.

Two of these provinces, Leinster and Connaught, are separated by the Shannon where it



flows southward through the central plain. The chain of lakes must once have formed a very useful barrier between the two kingdoms, which were often hostile.

Connaught, as you may see by comparing Plates XVI, p. 179, and XIII, p. 162, contains the part of the Irish plain which lies west of the Shannon, and also the rim of mountains along the Atlantic coast. Leinster contains the part of the plain which lies east of the Shannon, and also the group of the Wicklow Mountains, which adjoin the east coast immediately south of Dublin.

To the north of Leinster and Connaught, filling the rounded projection towards Scotland, is the province of Ulster, while the province of Munster occupies the south of Ireland. County Clare, which is the point of land to north of the Shannon estuary, belongs, however, to Munster and not to Connaught. This at first seems curious, but if you reflect that the people of Clare can easily go in boats to Limerick across the Shannon, you will see that it is not unnatural that County Clare should belong to the same province as Limerick. In the days of our great-great-grandfathers, people in Ireland travelled more easily by water than by land, because the roads were very bad.



## CHAPTER XXVI. THE EMERALD ISLE

IRELAND is often described as the Emerald Isle. The emerald is a very beautiful precious stone which is green, and Ireland is compared to the emerald because green is its general colour.

In Scotland and the north of England, as we have seen, there are great moors of purple heather. In other parts of England the ploughed fields are at one season naked, and at another golden with the harvest; but Ireland is almost from end to end, and at all seasons, a land of green grass and moss. This is caused by its moist climate, for Ireland is surrounded on the north, west, and south by the broad waters of the Atlantic Ocean.

If the wind in this part of the world blew mostly from the east, then the oceanic position of Ireland would not much matter, for the wind would come to it chiefly from the continent of Europe. It would bring dry air off the great land, and there would not be very much rain.

But, fortunately, on more days of the year than not the wind in our country blows from the north-west, the west, or the south-west. Therefore it brings to Ireland great supplies of moist air from

the ocean. As this air drives against the high Irish mountains it forms clouds, and the clouds throw down much rain, and the green grass grows.

There is another way also in which the neighbourhood of the Atlantic Ocean influences the climate of Ireland. To understand how this happens you should make an experiment.

Take a piece of stone and tie it to the end of a string, and then hold it by the string for some time in a cup of hot water, until the stone and the water are at the same heat. Now lift the stone out, and let it stand beside the cup of hot water on a table. The stone will grow cold much quicker than the water.

If now the water and the stone be put side by side for a few moments in the oven or on the hob, and then be replaced on the table, the stone will be found much hotter than the water.

The lesson you learn from these experiments is that the land, which is made of stone and earth, gets hot and grows cold quicker than the sea.

I think it will be clear to you that if the wind came most often from the east, and blew therefore chiefly from the land, it would be a very hot wind in the summer and a very cold wind in the winter.

In Ireland, however, the wind comes chiefly from the west, from the ocean, and brings on to the land the temperature of the water. Therefore in the Irish summer, although the air is warm, it

is not very warm, because the sea does not then become so hot as the land. Likewise in the winter, although the wind is cool, yet it is not very cool, because the water from which it blows cools only slowly, and therefore in the winter time it still keeps much of the heat of the previous summer.

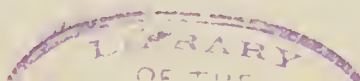
For these reasons we say that Ireland has an oceanic climate. At all times of the year it is moist, and the heat of the summer and the cold of the winter are not excessive. Thus it is that in Ireland there is not nearly as much snow as in England, and the grass remains green and good for the food of cattle through most of the winter, especially in the west of Ireland. But, on the other hand, Ireland does not grow much wheat, partly because there is too much rain in the summer, and partly because the summer is not hot enough to ripen the wheat.

The wealth of Ireland consists chiefly of horses and cattle and pigs, and the crops are mostly hay and potatoes and oats. There are nearly as many cattle in Ireland as there are in all Great Britain, although Great Britain is nearly three times as large as Ireland. But the sheep of Great Britain are much more numerous than those of Ireland, for they live on the short mountain grass of the broad uplands, whereas the rich lowland meadows of Ireland are fitter for cattle.





XIII. IRELAND, PHYSICAL.





*Copyright.]*

XIV. GLENGESH IN DONEGAL.

*[W. Lawrence.]*



One result of the agricultural character of Ireland is that it trades chiefly with Great Britain, and not with foreign lands across the ocean. Close at hand there is a good market for Irish produce. The great manufacturing towns of England and Scotland require large supplies of food. Now food is just what Ireland produces most. It sends to the sister island butter and bacon and cattle ; it also sends much hay to be eaten by the horses in England.

If you think all this over, it will not surprise you to find that the largest places in Ireland are not in the interior, but are seaports. There are only six of them which are larger than little market towns. Arranged in order of size these are Belfast, Dublin, Cork, Londonderry, Waterford, and Limerick.

You will notice at once that five out of these six are on the coast opposite to England and Scotland. Only one is on the west coast, and that is the smallest of the six. It would not be there, but that the great river Shannon flows to the west. Yet all the way along the west coast of Ireland there is abundance of harbours. Indeed, many of the finest harbours in the British Isles are placed side by side between the rocky headlands along this coast.

One group of these harbours, with their separating promontories, appears on the map as a



remarkable fringe, like the fringe of a shawl, at the south-west corner of Ireland. The steamers from America pass daily within sight of Cape Clear, the southern point of Ireland, and yet these harbours are not used for commerce, because around them



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FIG. 75.—THE BOG OF ALLEN.

The peat is being cut for fuel.

there are no coal-fields and factories, as there are round the Clyde in Scotland and the Mersey in England. There are not even fertile meadows as there are in the central plain near Dublin, for

these splendid harbours, whose length you might measure, are surrounded by the highest mountains in Ireland, which are very beautiful, but produce little food and support only a small population.

The western mountains of Ireland are clothed over with bog-moss, and only in steep places does the naked rock show through. This is, of course, a result of the constant moisture of the air.

But moss is abundant also in the Central Plain where it grows along the borders of the lakes, and indeed has often filled them with peat, which is merely dead moss heaped layer upon layer and turned brown.

The surface of the great peat-bogs is green in the springtime, with young moss on the top, but it is very treacherous, and liable to engulf men or animals which venture upon it. The peat is cut and dried for use as fuel. In most Irish houses there are peat fires, not coal fires (see Figs. 72, p. 161, and 75, opposite).

## CHAPTER XXVII. A JOURNEY THROUGH IRELAND

Now that we have learned something about Ireland, let us bring our foreign friend from Scotland and show him the country. I think we last saw him at Stirling. Let us follow carefully upon the map his journey through Ireland. Naturally he will cross by steamer to that corner of the country which is nearest to Scotland.

Belfast will be the first large place to which he will come. It lies at the head of Belfast Lough, an estuary of the sea; for the Irish, like the Scotch, apply the word lough to arms of the sea, as well as to fresh water lakes.

Belfast is one of the busiest cities in the whole United Kingdom, and is larger even than Dublin. In many ways it is more Scotch than Irish, for many Scotch people have in past times settled in this corner of Ulster.

The trade by which Belfast, and several places around, first grew rich was the manufacture of linen. The flax plant, from the fibre of which linen is made, is grown in this part of Ireland, and nowhere else in the British Isles. But the





FIG. 76.—FLAX RIPPLING IN ULSTER.

The word to "ripple" here means to "strip."

Irish factories require much more flax than is raised in Ireland, and raw flax is therefore imported to Belfast in large quantity.

In recent times, however, shipbuilding has become almost more remarkable at Belfast than the manufacture of linen. This is curious, because all the steel and coal have to be brought across the water from Scotland and England. In part it is due to the skill and enterprise of a few men, but in part also to the fact that women and girls are chiefly employed in making linen, and

that the men of their families are therefore free for other work.

From Belfast we can go to Londonderry either by rail or by steamer. If we go by rail we shall pass Lough Neagh, the largest lake in the British Isles. It is only a very little smaller than the English county of Rutland, and is larger than the county of London. This you can see for yourself by drawing the outlines of Lough Neagh, and the counties of Rutland and London, on the same sheet of paper. Of course you must take care that you draw them all on the same scale. There are storms which are dangerous for boats on the broad waters of Lough Neagh.

If we go from Belfast to Londonderry by sea, we shall pass round a very interesting coast with splendid cliffs. As we turn Fair Head we shall come in sight of the columnar basaltic rocks of the Giants' Causeway, which we have already described along with Fingal's Cave in Staffa.

Londonderry is a smaller town than Belfast, but inhabited by the same Scotch-Irish people, and engaged in the same linen manufactures. Its old name was Derry simply. It took the name of Londonderry because the citizens of London obtained much land in this district in the time of the Stuart Kings.

Beyond Londonderry is County Donegal, and here we leave the rich manufacturing portion of



Ulster and enter one of the wildest parts of Ireland. Donegal is filled with a series of mountain ridges which are bare of trees, and often clothed only with bog. The mountains of Donegal stand out southward into some of the most magnificent cliffs in the world, towering two thousand feet above the ocean below (see Plates XIV and XV, pp. 163, 178).

Returning now to Belfast, we start southward along the east coast, passing in the first place the Mourne Mountains, a striking group in the south of County Down, visible from the Isle of Man. Then we come to the central plain, and here near Drogheda we cross the river Boyne, where William III, marching from the North of Ireland, defeated James II, who had come from Dublin.

The capital of Ireland, Dublin, stands at the mouth of the river Liffey, just where the mountains of Wicklow sink into the central plain, as you may see by comparing Plates XIII and XVI, pp. 162, 179.

Dublin owes importance to the fact that the roads, canals, and railways radiate from it northward, westward, and southward all over Ireland. Most of the manufactured articles required by the Irish population are imported here from England, and distributed hence. Being at the centre of the Irish roads and railways, and at the chief port of entry from England, Dublin is also the most convenient place for the seat of government.

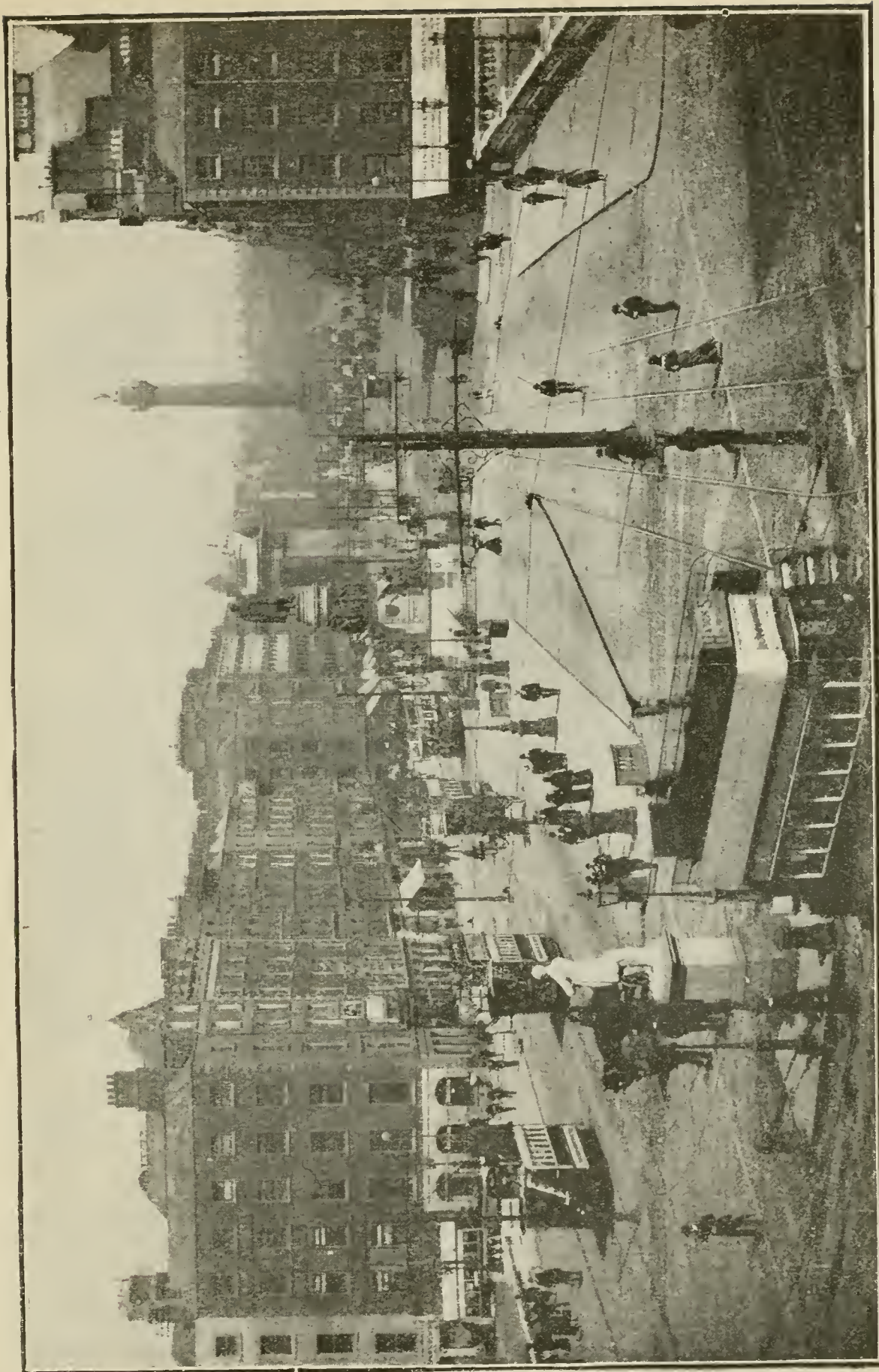


The portion of Ireland which lies south of a line drawn westward from Dublin through Athlone to Galway, contains a great deal of beautiful country. Immediately south of Dublin are the mountains of Wicklow, whose scenery is very like that of Wales on the opposite side of the St. George's Channel.

In the midst of Wicklow is the lovely valley of Glendalough, with a curious and very ancient round tower (see Plate XXX, p. 291). There are two little lakes also at Glendalough, into which St. Patrick is said to have driven all the snakes of Ireland, so that they were drowned. This took place a long time ago, and you need not believe it unless you like. But it is a fact that there are now no snakes in Ireland, although, as you know, there are poisonous adders in many parts of Great Britain.

At the south-eastern corner of Ireland we come to Waterford, placed where three rivers—the Barrow, the Nore, and the Suir—gather to a single estuary, just as the Trent and the Ouse join to make the Humber. Here, therefore, supplied by the traffic down these rivers, is the considerable port of Waterford.

The rest of the south of Ireland, as you see it in Fig. 78, p. 172, presents a very interesting appearance. It is something like a piece of ploughed field on a great scale, with the ridges and furrows running west and east. The rivers Blackwater, Lee, and



[W. Lawrence.]

FIG. 77.—SACKVILLE STREET, DUBLIN.

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FIG. 78A.—BANDON.

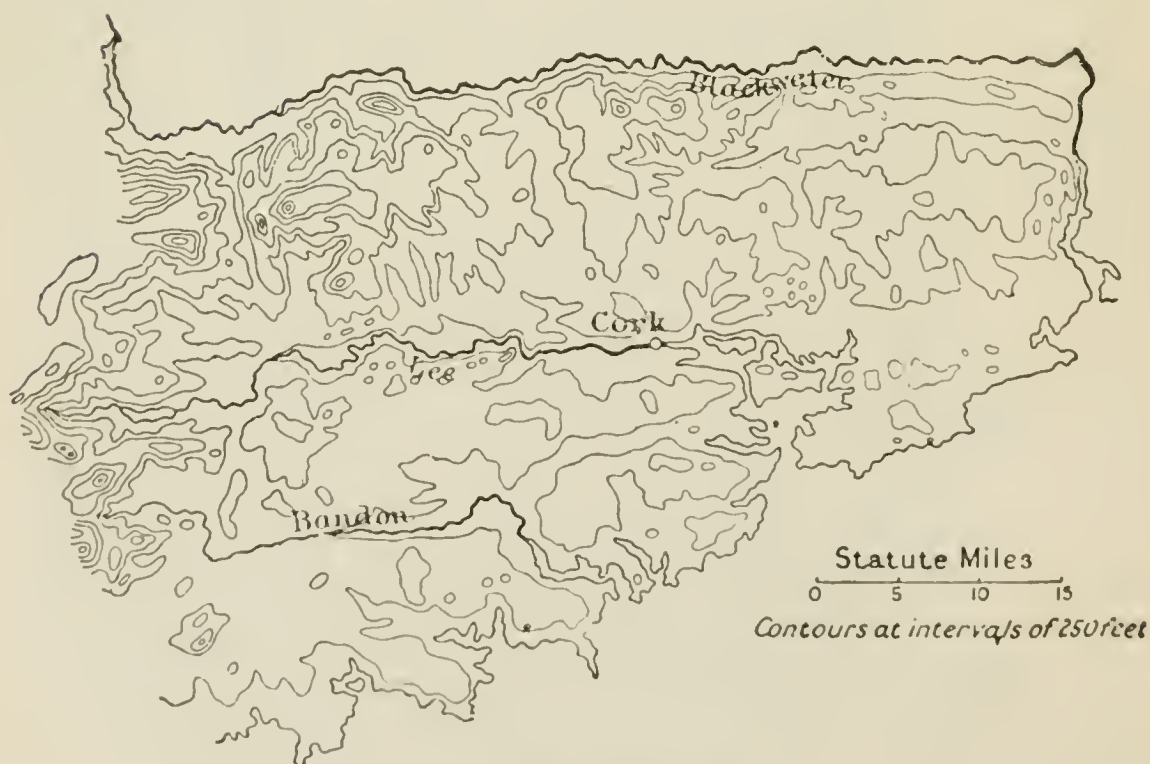


FIG. 78B.—BANDON.



Bandon flow eastward side by side, their valleys being straight like the ploughed furrows. Then each in turn makes a sudden bend southward,

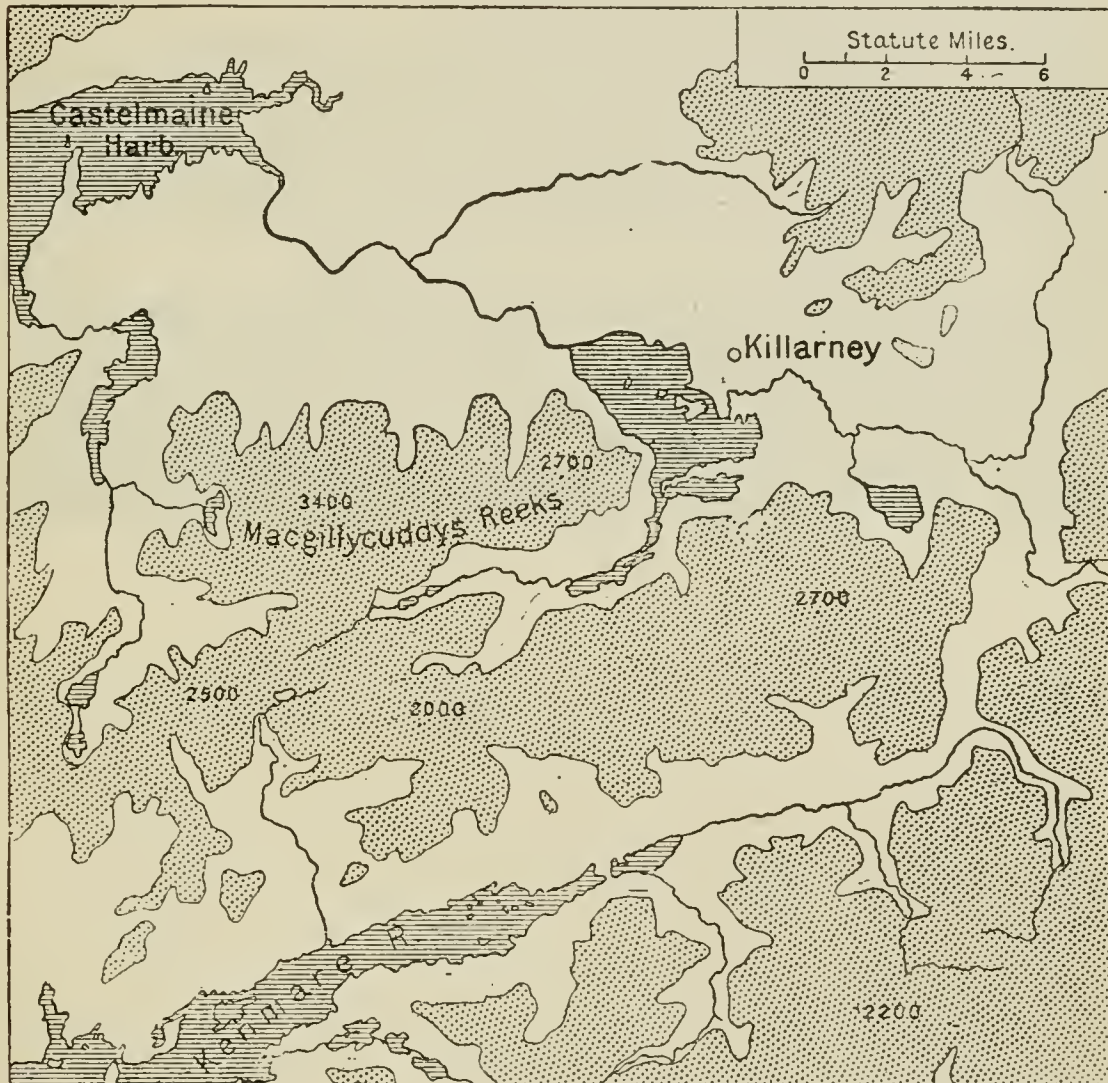


FIG. 79.—THE LAKES OF KILLARNEY. Dotted portion more than 600 feet.

On Fig. 71, p. 149, find out the space covered by this map, using the scales of miles in the two figures.

and, passing through a gap in the mountain ridge, spreads out into an estuary which forms a useful harbour. There are very beautiful woods in these valley bottoms. If you have any difficulty in



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FIG. 80.—THE LOWER LAKE AT KILLARNEY.

understanding Fig. 78, look at it again when you have read the next chapter.

The most important of the southern group of harbours is at Cork, the chief town of the south of Ireland, but very much smaller than Belfast in the north, for in the main it is a seaport, exporting the produce of the surrounding country, and has but few manufactures.

In the harbour of Cork is an island on which stands Queenstown. Here the Atlantic steamers make a short call on the voyage between Liverpool and New York.

Finally, west of Cork is the most beautiful district in Ireland. At the foot of the highest peaks

in the island, known by the extraordinary name of Macgillicuddy's Reeks, are the Lakes of Killarney, with wooded banks and islands and towering mountains, and here the Atlantic mists hang round the heights with ever-changing effects of sunshine and cloud. (Figs. 79 and 80.)



## CHAPTER XXVIII. THE WELSH MOUNTAINS

WALES is a smaller country than Scotland or Ireland. The space it occupies is less than one-half of that occupied by either of them. On looking at the map of the British Isles, we naturally ask why Wales ever came to be a separate country from England.

It is true, of course, that there is sea to north, west, and south of Wales, and that it is therefore a peninsula. But it is a very different kind of peninsula from Scotland, for no narrow isthmus joins it to England. The connexion is so broad that Wales is attached to England by nearly the whole length of one of its sides. If a peninsula of this kind were necessarily a separate country, then the counties of Norfolk and Kent on the eastern side of England would also be separate.

What then is it which has caused Wales to be a land apart? Let us inquire into its height, and see if the cause lies there. We will be a little more precise than we were in dealing with Scotland and Ireland. To study the height of Wales we will employ what are called contour-lines.

Now what is a contour-line? The word contour means shape. Therefore a contour-line must mean a shape-line. If a man goes to a tailor's shop to order a suit of clothes, the tailor will begin by measuring him. Let us say that he is a tall, very stout man, that he measures 45 inches round

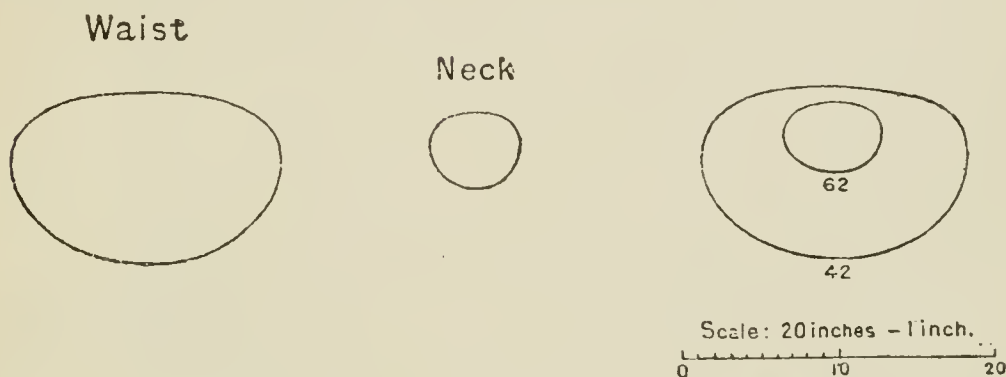


FIG. 81.—CONTOUR LINES OF A MAN.

the waist, and that his waist is 42 inches above the ground. The tailor might put this down on a sheet of paper in the way in which we have done in the left-hand drawing of Fig. 81. Our drawing is to a scale of one-twentieth. One inch on the paper is therefore the same as twenty inches on the man's waist. If with a bit of thread you carefully measure round the line shown, and then multiply by 20, your result should be 45 inches.

Notice that the line is not quite circular; the loop is flattened on one side to represent the man's back. Thus the line that we have drawn shows the shape of the man's waist, as well as the distance round it according to the scale. We should

describe this line as the contour-line of the man at a height of 42 inches above the soles of his boots.

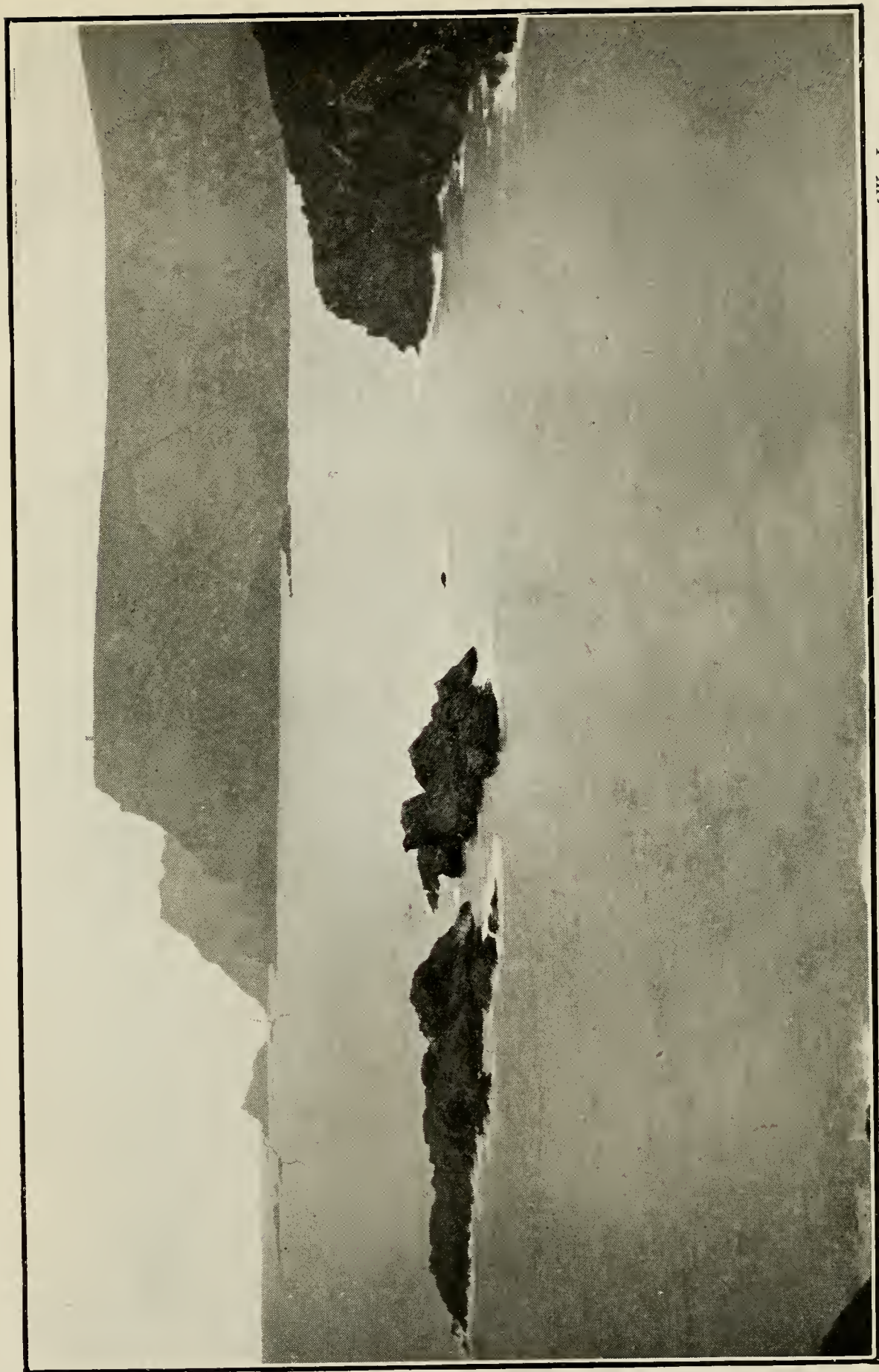
Suppose that the tailor's next measurement were round the man's neck, which is, we will say, 62 inches above the ground. You can find from the loop shown in the middle drawing of Fig. 81 how many inches he is round the neck, because this loop is also drawn on the scale of one-twentieth. We should describe it as the man's contour-line at a height of 62 inches.

Now look at the right hand drawing in Fig. 81. Both the loops are here shown in one drawing. Against the larger of them is written 42 inches, and against the smaller 62 inches, and below you see the scale, which tells you that the drawing is one-twentieth of the natural size. From this one drawing you can tell the exact shape and size of the man, or, in other words, his contour, at a height of 42 inches and again at 62 inches.

Be careful to note that the number put against the larger loop is not 45 but 42. You can find for yourself, by measuring according to the scale, that the man's girth is 45 inches, but you require to be told that the height at which the measurement was taken was 42 inches from the ground.

Let us think of the matter in another way. Supposing our friend were to leave the tailor's shop and were to go for a bathe in the sea. If





[W. Lawrence.

XV. GLEN HEAD IN DONEGAL

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the sea were very calm indeed, and there were no waves on it, the water would rise steadily as he waded out on the sloping shore. At a height of 42 inches he would make a hole in the surface of the sea, whose shape and size would be like that of the outer contour-line in Fig. 81. When at last he was neck deep, the hole which he would make in the surface would, of course, be that shown by the inner contour-line.

Now let us look at the picture and the three little maps in Fig. 82. They show us in four different ways the mountain of Holyhead. This mountain, which is about 700 feet high, is seen far out at sea when you are coming to Wales from Ireland. The harbour of Holyhead is at its foot, and here the steamers land their passengers from Dublin.

Fig. 82B has been drawn in the same way as many of the other maps in this book. We have supposed the sea to rise 600 feet up the sides of the mountain, as we saw it rise just now up to the neck of the man. The dotted part of the map shows how much of the mountain would remain above the water, and the line round this dotted space is the 600-foot contour-line. It shows the shape of Holyhead mountain at a height of 600 feet above the sea. In Fig. 82A we have marked the height of 600 feet by a straight line.

But Fig. 82c, if you will take the trouble to read it, will teach you much more of the shape of



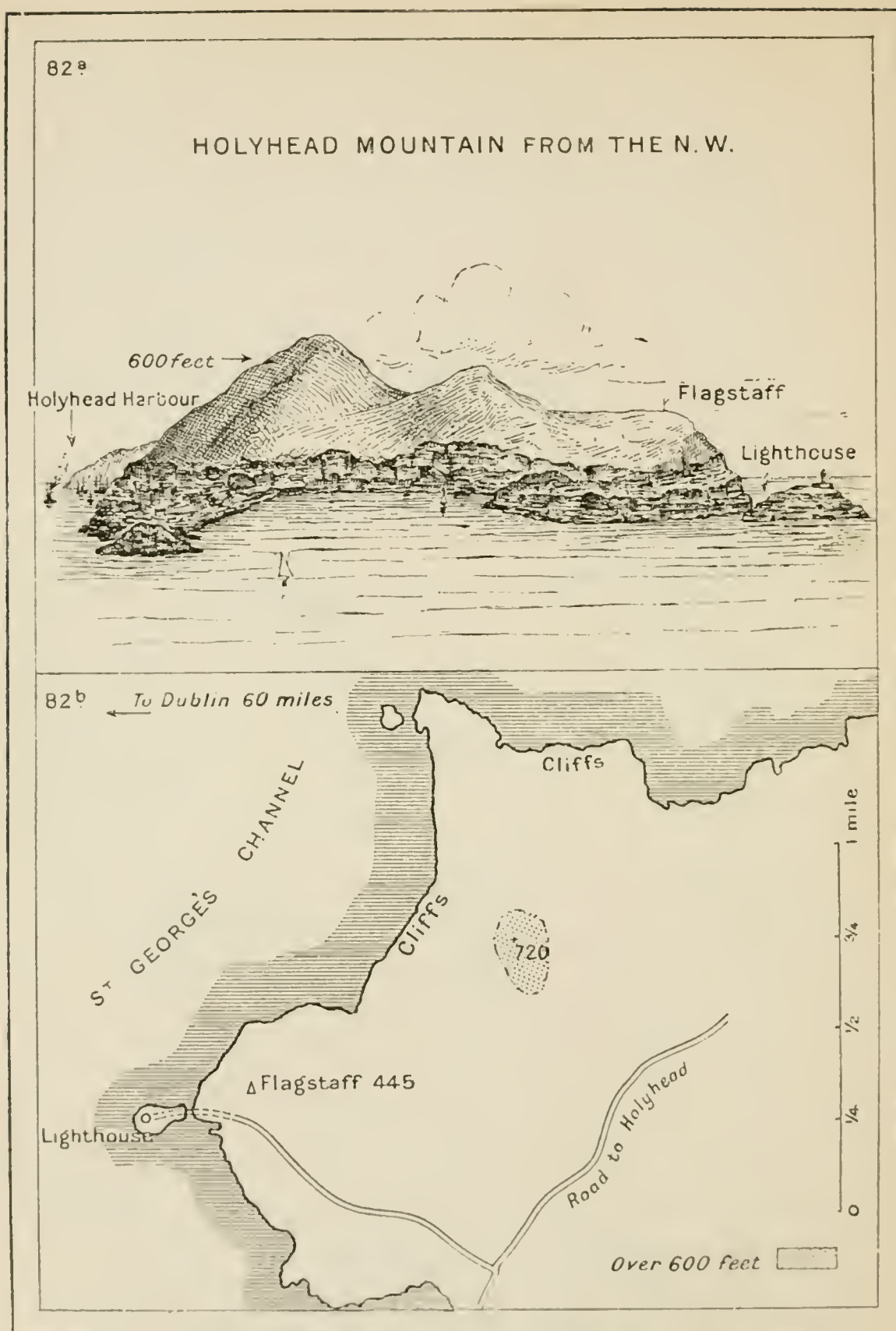


FIG. 82A, 82B.—HOLYHEAD MOUNTAIN.

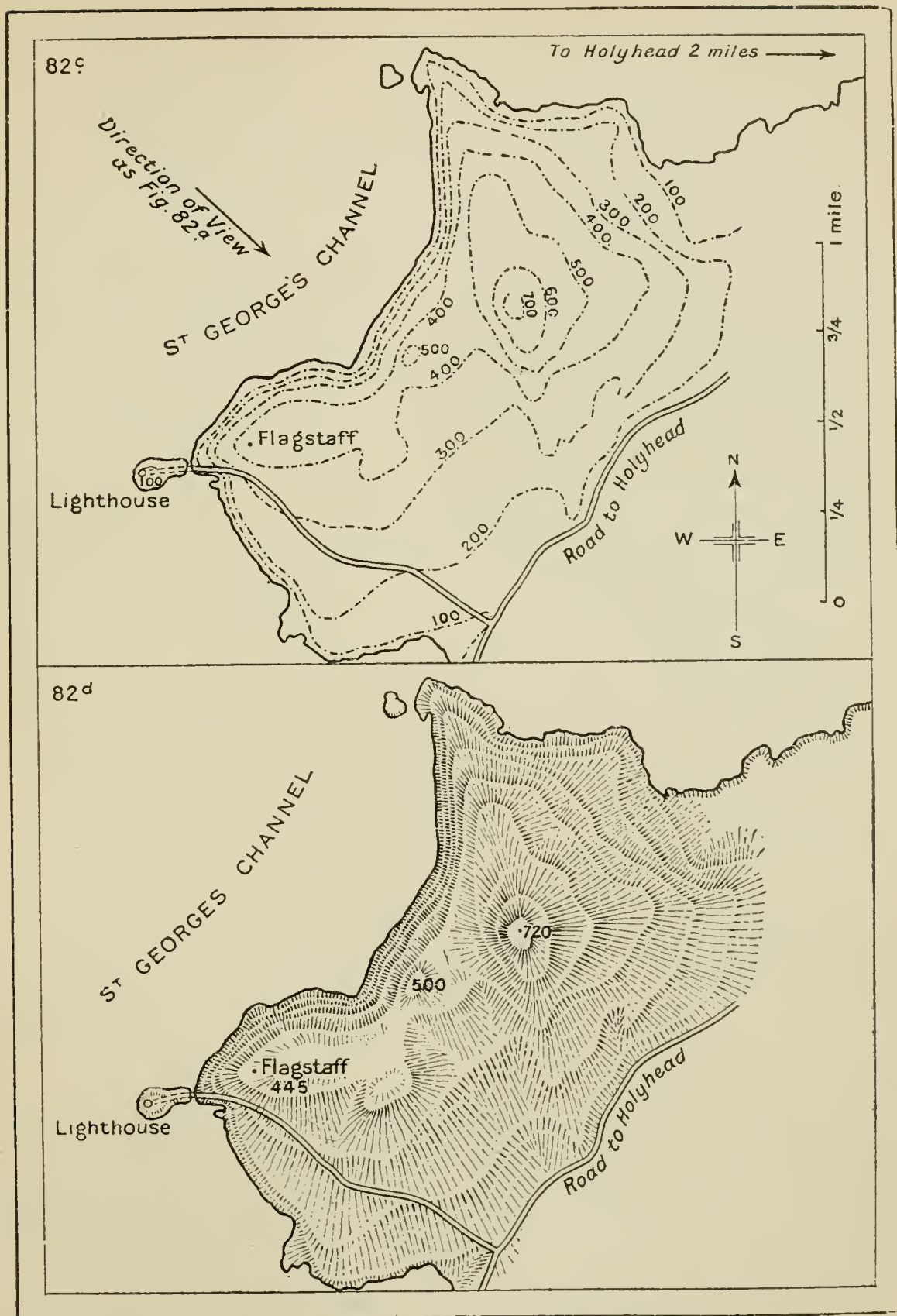


FIG. 82C, 82D.—HOLYHEAD MOUNTAIN.



FIG. 83A, 83B, 83C, 83D.—THE WELSH MOUNTAINS.

the mountain than Fig. 82B, for it shows you a contour-line every hundred feet all the way up from the sea shore to the top. The contour-lines are put one within the other, just like the neck-line and the waist-line of the man in the right hand



drawing of Fig. 81. You can show in this way any number of contour-lines on a mountain, for it grows steadily smaller as you go up it, whereas man is widest about half way up.

If you make a dot with your pencil at some point where you would like to stand on the mountain and enjoy the view, you can count the contour-lines up from the sea and so learn how high you have climbed. This you can do on Fig. 82c, but on Fig. 82B you could only find out whether you were above or below 600 feet.

In Fig. 82D we have yet another way of showing our mountain. This is done by what is called hill-shading. The strokes of the shading are drawn down the slopes, not round them like the contour-lines. They show you the way the water would run off the sides of the mountain when it rained. Each little black stroke is a furrow made in the steep slope by the rain-water coursing downward.

If you now look back to Figs. 73, 78, and 79, pp. 156, 172, 173, I think you will see more clearly what they mean.

At the Post Office we can buy a sheet of the ordnance map containing some hill in our own neighbourhood, and if we will take the trouble we can make drawings from it like Figs. 82c and 82D.

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Next we will look at the four little maps in Fig. 83. If the sea were to rise 500 feet round



FIG. 84.—THE WELSH MOUNTAINS, COMBINED CONTOURS.

Wales, it would, of course, flow in over the low-lands, and would reduce the dry land to the part which is above the 500-foot contour-line, as shown in Fig. 83A. If the sea rose further to 1,000 feet, the dry land remaining above the water would be



FIG. 84A.—THE WELSH RIVERS.

that shown within the 1,000-foot contour-line in Fig. 83B. If the sea rose still further to a level of 2,000 feet above its present surface, only those small parts shown in black in Fig. 83C would stand above the now broad waters. And lastly, when



the sea rose to 3,000 feet only a few summits in the north of the country would stand above the ocean. One of these, Snowdon, would form a short hilly island, about 600 feet high, for the height of Snowdon above the present sea level is about 3,600 feet. It is the highest mountain in Wales.

All four of these contour lines are shown together in Fig. 84, which has been made in the same way as Fig. 81 and Fig. 82c. If you make a tracing of Fig. 84, and then shade with pencil the parts below 500 feet, you will see clearly the deep valleys running up into the high ground. In Fig 84A are the rivers which fit into these valleys, and you can put them into your tracing and mark their names.

Let us turn to the maps of the other parts of Britain, as shown in Plates XIII and X, pp. 162, 100. The land coloured green, as the index in the corner tells us, is less than 600 feet high, and that coloured brown is more than 600 feet high. Therefore the line where the green and the brown join is the 600-foot contour-line for the part of the country shown in each Plate.

With the help of a local map it would be interesting to find the direction, distance, and height above our schoolroom of the highest mountain or hill in our part of the country.

This is a very difficult chapter, and you will probably have to read it again and again in order

to understand it ; but it is worth the trouble, because if you understand this chapter you will find every chapter in this book, and in the other books which come after it, easier to understand and more interesting.

## CHAPTER XXIX. THE PRINCIPALITY

Now let us come back to our question, and let us ask again how little Wales came to be a separate country from England.

The first thing that strikes us on looking at the map of Wales is that the greater part lies more than 500 feet above the sea, and that a large part is more than 1,000 feet. On the other hand, only a few small portions rise to 2,000 feet, and only a few summits to 3,000 feet. If we except the low-lying grounds of Anglesey, part of Carnarvon and part of Pembroke, most of Wales is an upland (Fig. 83, p. 182).

You can easily measure for yourself the length and the breadth of the Welsh Upland, and you may ascertain how many times it is longer and broader than it is high. You will find that like the Penine Range it is in bas-relief, as the King's head on a penny.

Wales must be compared therefore to the broad hilly districts of Scotland and the North of England, and is very different from the lowland of Ireland with its small groups of high mountains.

Let us think for a moment of the Highlanders of



Scotland, who were described in the First Part of this book. Until 160 years ago the Highlands of Scotland were inhabited by barbaric Celtic tribes who at times came down the glens in order to rob the peaceful farmers of the Lowlands.

So was it also with Wales. There, too, the inhabitants were Celts who found refuge amid the mountains, and robbed the peaceful English settled in the fertile lowlands beyond the eastern border of the Principality. A glance at Plates XXV, p. 258, XXVIII, p. 275, and X, p. 100, will tell you that all the centre, the east, and the south of England lie low, and that Wales is a kind of fortress rising high above England all along the Welsh Border.

Long ago the English, under Hengest and Horsa, came over the Narrow Seas from Germany. At that time the Welsh were settled in the plain, but the English fought with them, and after killing many drove the rest into the mountains of Wales. There, because the country was easy to defend, the Welsh continued to live. It is easy, is it not, to stop a person trying to come upstairs? And you get out of breath, do you not, when you climb a hill?

The language spoken by the Welsh is different from that spoken by the Celtic Irish and Scotch, but is so like the language of the Celtic people who live in the French Peninsula of Brittany, that the Welsh and the Bretons can understand one another,

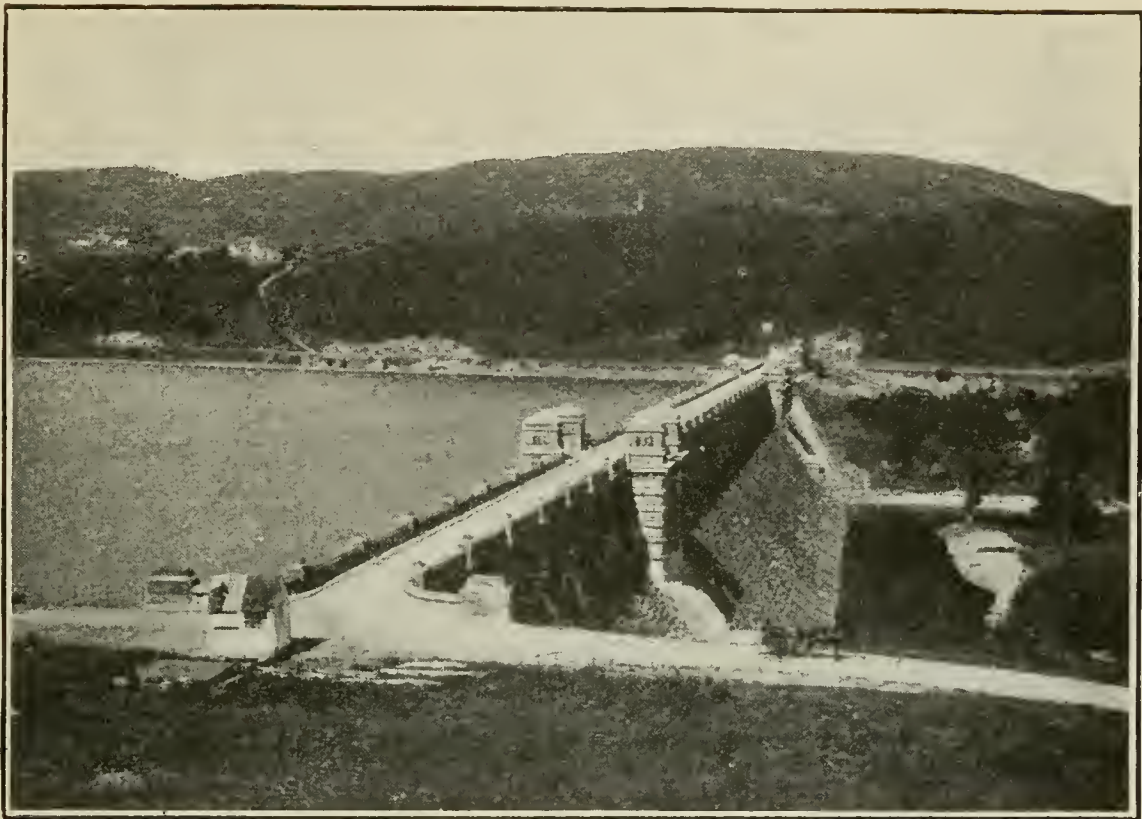
although they cannot understand the Scotch and the Irish.

In the time of Edward I the English conquered Wales in order to put an end to the robbing and killing in the neighbouring parts of England. The Celtic Highlanders of Scotland were conquered for the same reasons.



FIG. 85.—THE COALFIELD OF SOUTH WALES.

To-day the greater part of the Welsh people, like the greater part of the Scotch people, are gathered into one small district. It is in the south, in the county of Glamorgan, where there is a rich coal-field. The coal of South Wales is of peculiar value, partly because it is the best coal in the world for use on board ship, and partly because it is got not very far from the shore, and therefore easily placed upon ships. South Wales sends a great deal of coal to



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FIG. 86.—THE DAM OF MASONRY BUILT ACROSS THE VALLEY TO MAKE LAKE VYRNWY, A RESERVOIR SUPPLYING LIVERPOOL.

all parts of the world, chiefly through the ports of Cardiff, Barry, and Newport.

On the map you will see that Newport stands in the county of Monmouth. This is an English county, but it is inhabited largely by Welsh people and used to be a part of Wales. Further to the west, but still in the neighbourhood of the coal, is Swansea, another great seaport. Here iron and other ores, brought over the sea from foreign countries, especially from Spain, are smelted with Welsh coal.

In all the remainder of Wales there is only a very



small population, for there is no fertile and cultivated lowland to be compared in size with that of Central Scotland. There are many cattle in the peninsulas of Pembroke and Carnarvon and in the island of Anglesey. But the high ground of Wales is fit for the pasture only of sheep.

In the last few years Wales has become valuable to England on account of the large rainfall received by its hills from the westerly winds. You will see on the map that the four chief rivers of Wales—the Dee, the Severn, the Wye, and the Usk—all of them rise in heights near the west coast, and flow through deepening valleys, like the Pennine dales, eastward into England. Emerging from these valleys, they wind through the plains of England, and bending gradually round to north and to south, reach the Irish Sea and the Bristol Channel.

At a great cost strong dams have been built across the heads of some of these Welsh valleys, so that the upper reaches of the streams have been converted into reservoirs, so large that they are really artificial lakes. The water is carried down into England by great pipes known as aqueducts, which are like the aqueduct 100 miles long from Thirlmere to Manchester. You will remember that we measured the length of that aqueduct when we were reading the First Part of this book. Liverpool and Birmingham are supplied with water



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FIG. 87.—CARNARVON CASTLE.

from the reservoir lakes of the Welsh mountains.

Wales has no capital. The map, as we have now learned to read it, will tell us the reason why. In the old time, before roads had been made over the hills, there were only six easy paths in Wales. Four of them ran from England up the four great river valleys; the other two followed the north and south coasts. Therefore the chief Welsh roads did not and do not gather to any great centre, as the roads of Ireland gather from north, west, and south to Dublin. It was, of course, much



easier in the time before railways for the people of North Wales to go to England by the valleys or coast, than it was for them to cross all the length of the bleak hills in order to visit the South of Wales.

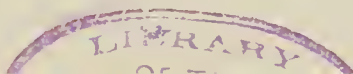
The chief railways of Wales now follow the north and south coasts westward. They carry the passengers and the letters for Ireland. The railway along the south coast leads to Milford Haven, a magnificent harbour used by the Fleet ; but the packet station for Ireland is at Fishguard, a little to the north of Milford. As you may see on the map, the passage to Ireland is there shortest. But the largest towns of Ireland are in the north and not in the south of that island, and therefore the railway along the north coast of Wales is the more important of the two. The high road and the railway cross the narrow Menai Strait into Anglesey by two celebrated bridges ; the road goes over a suspension bridge, the railway through a tubular bridge. Both road and railway end at the harbour of Holyhead, which stands opposite to Dublin, and therefore to the centre of Ireland (see Plates XIII and X, pp. 162, 100).

The Menai Strait is perhaps the most interesting part of Wales. Its shores are fertile, well wooded, and well farmed. A little inland runs the beautiful mountain range, of which the highest point is Snowdon.





XVII. WALES, PHYSICAL.





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XVIII. MENAI STRAIT.

[Photograph Co., Ltd.



This range served in the old days to defend the Menai district from English attack. When all the rest of Wales had been conquered, the Prince of Wales still held out behind the barrier of Snowdon. At last Edward I overcame the resistance, and built three great castles to secure the English rule here, at Conway, Carnarvon, and Beaumaris. But as a record of the brave defence, and to honour his new subjects, he called his eldest son the Prince of Wales.



## CHAPTER XXX. THE SEVERN AND THE WEST OF ENGLAND

As we look along the western side of England on the map, we see, one after another, four great features, and these features form two pairs. First we have the square Irish Sea, and the broad, blunt peninsula of Wales. Then the whole character of the map changes, for we find the long narrow Bristol Channel running far up into the land, and the long narrow peninsula of the West of England standing far out into the sea.

In the south-west of Great Britain it is therefore possible for a steamer to go from Land's End inland until it reaches the great port of Bristol, and it is also possible for a railway train to run through the counties of Somerset, Devon, and Cornwall, as far as Penzance and St. Ives, which are the last towns in the direction of the Land's End. Let us measure (on Plate XX, p. 211) the distance from Land's End to Bristol, and find which is the further, the land way or the sea way. Of course the railways have to wind round the hills.

Steamers bringing food from other countries naturally go by the Bristol Channel, in order that the food may be warehoused in the midst of a large

population. But fishermen, whose work is on the sea, have their homes at places like St. Ives and Penzance, so that they may get quickly to their fishing grounds.

The first land sighted by a ship from the south when making for Bristol is the small group of islands called the Scilly Isles. Their climate, as you would expect, is even more oceanic than that of Ireland. So mild are the winters and springs that the people of the Scilly Isles live to a large extent upon the profits they make by supplying early flowers to the London market.

There are twin capes at the end of Cornwall, the Land's End, which is the most western point of England, and the Lizard, which is the most southern point. Between these rocky headlands is Mount's Bay, so called because of an island within it, St. Michael's Mount, crowned by a picturesque building, once an abbey, but now a private house.

To north of the Lizard are the famous tin mines of Cornwall, worked by the ancients, but lately abandoned, with a few exceptions, because tin is now got more cheaply from the East. Many Cornish miners have gone to work for gold in South Africa. But tin is dear just now, and some of the mines have been re-opened.

The peninsula broadens, as we travel north-eastward, into the large county of Devon. The hills also become higher, and are separated into three



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*[G. H. Fincham.]*

FIG. 88.—TRESKO GARDENS, IN THE SCILLY ISLES.

chief masses, known as Exmoor in the north, and Dartmoor and Bodmin Moor in the south.

The two latter are divided from one another by the deep valley of the Tamar, which rises close to the north coast and flows southward between the counties of Cornwall and Devon. At its mouth, the Tamar spreads out into a broad





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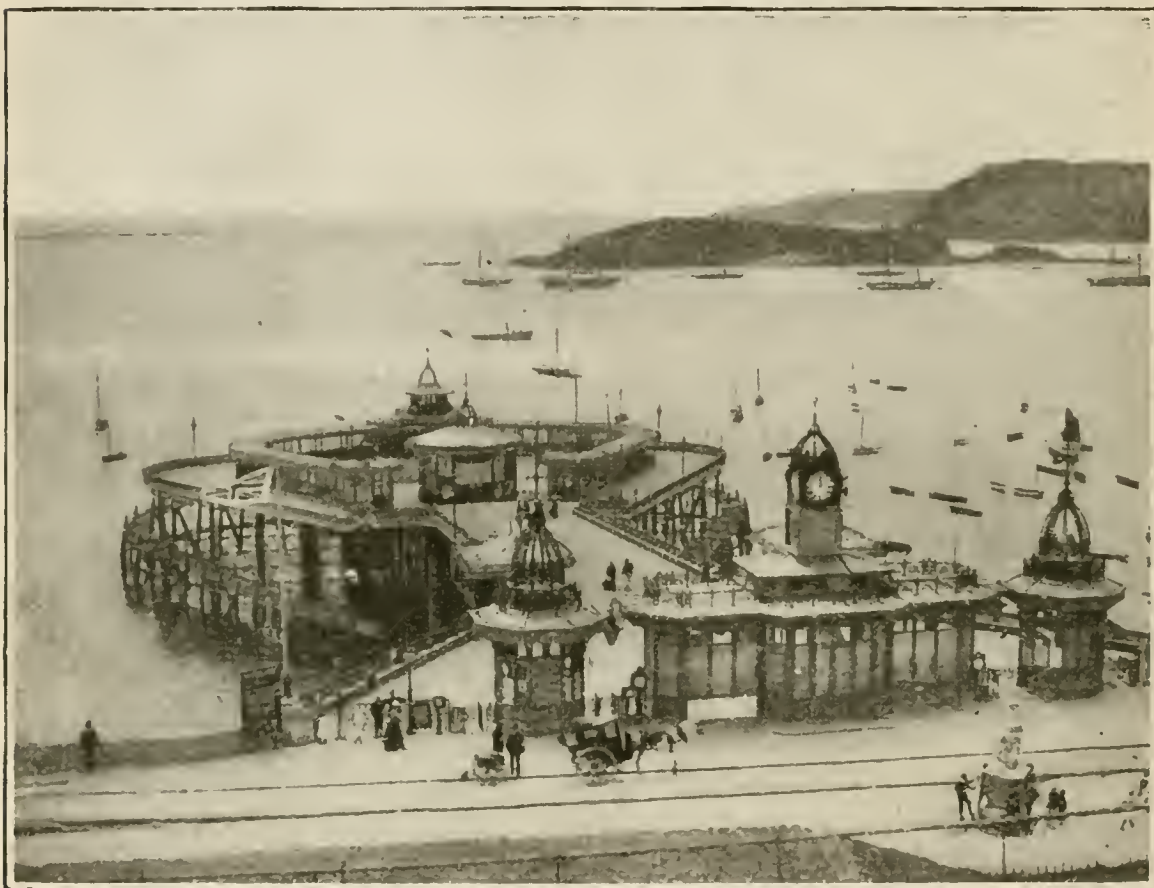
[Photochrom Co., Ltd.

FIG. 89.—FLOWERS READY FOR PACKING, IN THE SCILLY ISLES.

estuary, which is the harbour known as Plymouth Sound. Here are the towns of Plymouth and Devonport, with one of the three chief dockyards for the Navy. A breakwater of huge blocks of stone has been built across the mouth of the Sound, in order to prevent the Atlantic waves from entering the harbour. The ships come in by openings on either side, between the breakwater and the coast.

Cornwall is not quite like the other counties of England. This you may learn from the fact

that not very long ago Cornish people used to say, when they crossed the Tamar into Devon, that they were going to England. The syllable " wall " at the end of the name Cornwall is the same in meaning as the word " Wales." To call



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*[Payne Jennings.*

FIG. 90.—PLYMOUTH PIER, THE BREAKWATER IN THE DISTANCE.

a man Welsh in the language of the Saxons was the same as calling him foreign.

The people of Cornwall were Celts like the Welshmen, and not English. Their language was very like Welsh, and therefore also like the Breton language of Brittany. But the last person, an old



lady, who could speak Cornish died about 200 years ago. She must have found it very strange when there was no one else left who could talk her mother tongue.

If you look at the north coast of Devon you will see a broad bay between two pointed capes. This



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FIG. 91.—ON PLYMOUTH BREAKWATER.

bay has two names, for it is sometimes called Barnstaple Bay and sometimes Bideford Bay. Barnstaple and Bideford are two small ports at the heads of estuaries which flow into the bay. The sailors who were making for Barnstaple called the bay after their port, and those who were making for Bideford called it after their port.



You may learn from this fact the way in which the names of bays and gulfs have been given in most parts of the world. They were christened by the sailors. So, for example, we speak of the Bristol Channel, because at the head of it is the great seaport of Bristol, to which the ships in the Channel were mostly bound, until a short time ago Cardiff also grew to be a large port.

Exmoor is the high ground which runs from Bideford Bay eastward into Somerset. The river Exe rises here close to the Bristol Channel and flows like the Tamar right across the peninsula to the English Channel. At the head of its estuary is Exeter and at the mouth of it Exmouth. Here you learn how names are given on the land.

Very anciently, before there were any large cities in the country, the river Exe received its name from the ancient Britons. The word "Exe" in their language meant simply "water." No doubt the farmers around often spoke of driving their cattle to drink at "the water," and when the English came into the country and asked the name of the river, the Celtic farmers replied in their own language that it was the Exe, or "the Water." The English, however, who were travellers and had seen many rivers, called it "the Exe River," to distinguish it from the Severn and other rivers. The river Dart has in the same way given its name to Dartmoor and the town of Dartmouth.

Now let us go a little farther north-eastward, until we find that the peninsula of the West of England no longer consists of a single county going right across it, as in Cornwall and Devon, but is divided between two counties, Somerset and Dorset, in such a way that the north coast belongs to Somerset and the south coast to Dorset. We will leave Dorset to be described in the chapter which deals with the South of England, and will speak here only of Somerset.

The middle of Somerset, from the Bristol Channel inland, is occupied by a great marsh, called Sedgemoor. Sedge, as you know, is the name of a common marsh plant. The marsh has now been drained and turned into rich green meadows.

Some celebrated events in our history have taken place here. Very anciently, when the Danes had conquered most of the remainder of England, King Alfred took refuge on an islet in Sedgemoor, and hence he set out to recover England, and to win undying fame by his wise rule. You remember, of course, the tale of how he spoilt the cakes by letting them burn while he was thinking how to defeat his enemies. This took place in a cottage on the islet in the Somerset marshes.

Long afterwards a battle was fought in this neighbourhood between the Duke of Monmouth and the troops of King James II. It was the last battle on the soil of England, although there have been later battles in Scotland and Ireland.

The Somerset marshes come to an end where the limestone range of the Mendip Hills rises, like a wall, in the northern end of the county. Beyond the Mendips we find the river Avon flowing north-westward, and therefore in a direction parallel to the Mendip hills. You must get your teacher to explain to you what the word "parallel" means.

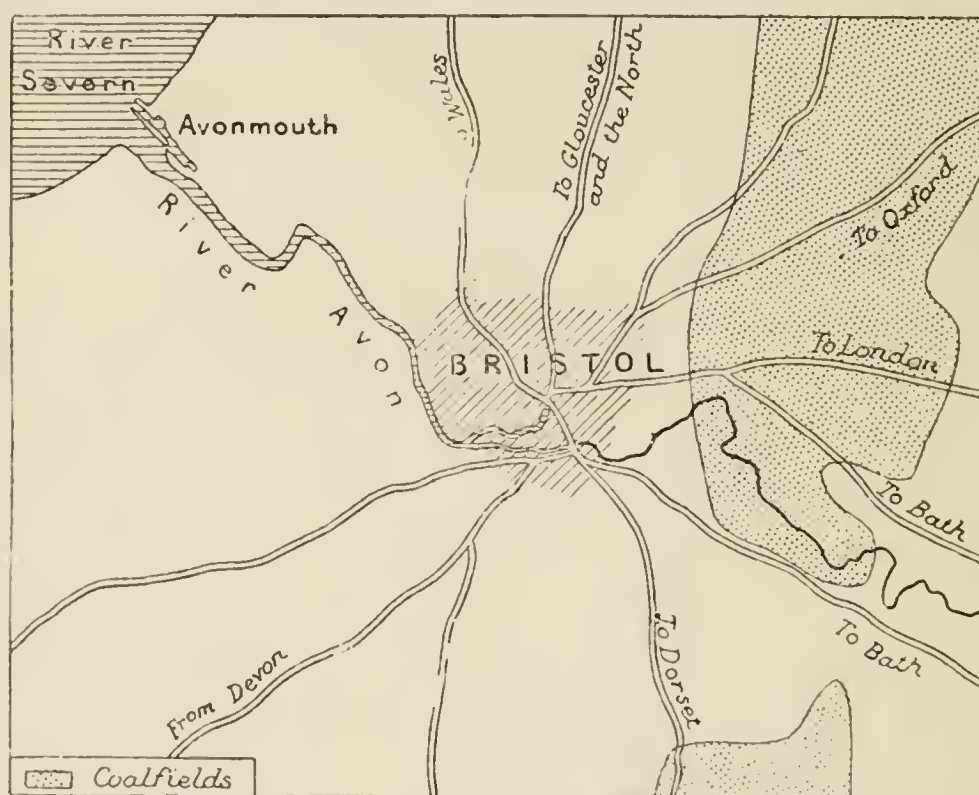


FIG. 92.—THE PORT, BRIDGE, AND COALFIELD AT BRISTOL.

The tides of the Bristol Channel are very high, as we learned in the First Part of this book, and therefore they enter the mouth of the Avon and run some way up. It is for this reason that Bristol has been able to grow into a great port, although the Avon is only a small river.

The word Bristol used to be written Brig-stow,





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FIG. 93.—THE MALVERN HILLS.

which meant “the bridge place,” because here the roads coming out of Devon and Cornwall and running north-eastward into the Midlands, were carried by a bridge over the Avon. Thus we see that Bristol became important for two reasons. It was a bridge place, and was also at the head of the tideway. In modern times the Avon below Bristol has been deepened to admit our large ships. Even so, some of the largest vessels cannot go up as far as Bristol, but stop at Avonmouth.

There is yet another reason for the importance of Bristol. The long peninsula of the West of England has no coal, but near Bristol, on both

sides of the Severn, there are coalfields. The head of the Bristol Channel is, in fact, surrounded with coalfields, in South Wales as well as near Bristol. Therefore we find here no fewer than four large ports, Swansea, Cardiff, Newport, and Bristol. Small vessels go up even to Gloucester.

The Severn and its beautiful tributary, the Wye, rise high on the broad moor of Plynlimon, and flow through Wales in deep valleys. From the edge of Wales they wind peacefully through the rich lowland plain of England, where the red Herefordshire cattle graze, and apples and hops are grown. They pass the ancient cities of Shrewsbury, Worcester, Gloucester, and Hereford, and then enter the Bristol Channel amid the smoke of South Wales, the Forest of Dean, and Bristol.

## CHAPTER XXXI. THE MIDLANDS OF ENGLAND

WE have now travelled through all those parts of Britain which contain mountains. From the Peak of Derbyshire we went northward past the Pennine Chain and the Lake Mountains into Scotland. Then we crossed over into Ireland, and so came to Wales and the West of England. But you will remember that in order to reach Derby our foreign friend, who landed at Dover, had to make a long journey through London and across the whole width of the undulating and cultivated English plain.

Look at Plates XXV, p. 258, and X, p. 100, and try to imagine yourself standing on the edge of the Welsh mountains. England would lie at your feet. Down below you the green meadows and golden cornfields would commence and would spread away eastward to the horizon. Beyond this you would picture them still spreading on, until at last they ended in a line of white surf, where the waves break along the sandy coast of the North Sea.



If you stood on the Derbyshire Peak and looked southward, the same rich country would extend before you until it ended on the shores of the English Channel. Except a few summits in the west, among the Mendip, the Cotswold, the Malvern, the Wrekin, and other hills near Wales, there is no height in all this plain more than 1,000 feet

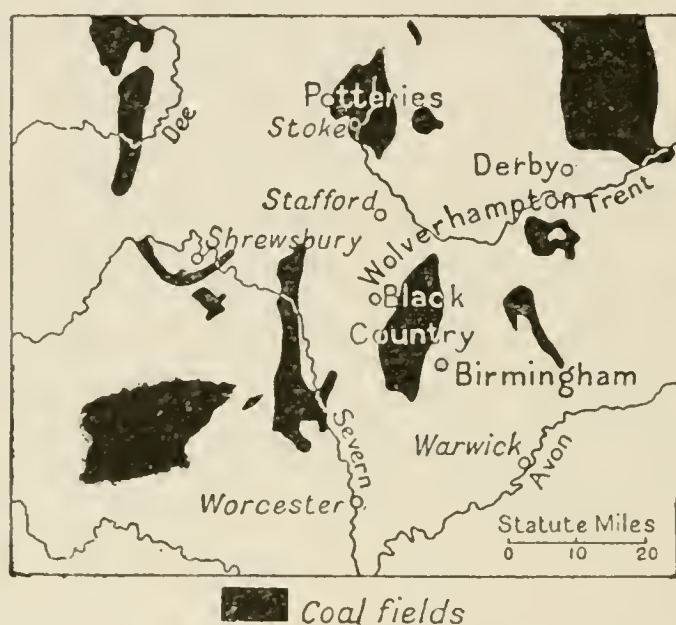


FIG. 94.—THE MIDLAND COALFIELDS.

above the sea. Here and there is a small common or heath, but as a rule every acre is cultivated or planted with valuable trees, and there are several hundred towns and several thousand villages. What a contrast to the broad sterile tracts of the Pennine Moors and the Welsh Uplands!

Let us measure the breadth of the English plain from Wales eastward, and from the Peak southward. It covers more space than the whole

of Scotland or the whole of Ireland. Note on the map how small are the hills in it which rise even 600 feet above the sea level.

The heart of this great English plain is known as the Midlands, for it occupies the centre of England. At the four corners are four ports, London, Bristol, Liverpool, and Hull, and in the midst is the great city of Birmingham. But there is one very remarkable difference between the north-west and the south-east of the Midlands. In the north-west, in the triangle between Bristol, Liverpool and Hull, there are here and there coal-fields, but in the south-east, in the triangle between Bristol, London, and Hull, there is no coal. All the Midlands are agricultural, but only the north-western parts have coal and great industries.

If you look on the map at the neighbourhood of Birmingham, you will see the two large rivers, Trent and Severn. The one rises in a corner of the Peak District, but the other in the midst of Wales. At first the Severn flows towards the Trent, then for a short distance they flow in the same direction, and finally go away from one another. The Trent goes to its mouth in the Humber estuary, but the Severn to the Bristol Channel. Where they turn away from one another, the Severn receives a large tributary from the north-east, which is called the Avon. This is not the Bristol Avon, but another river of the same name,

which flows past Warwick, and is therefore called the Warwick Avon.

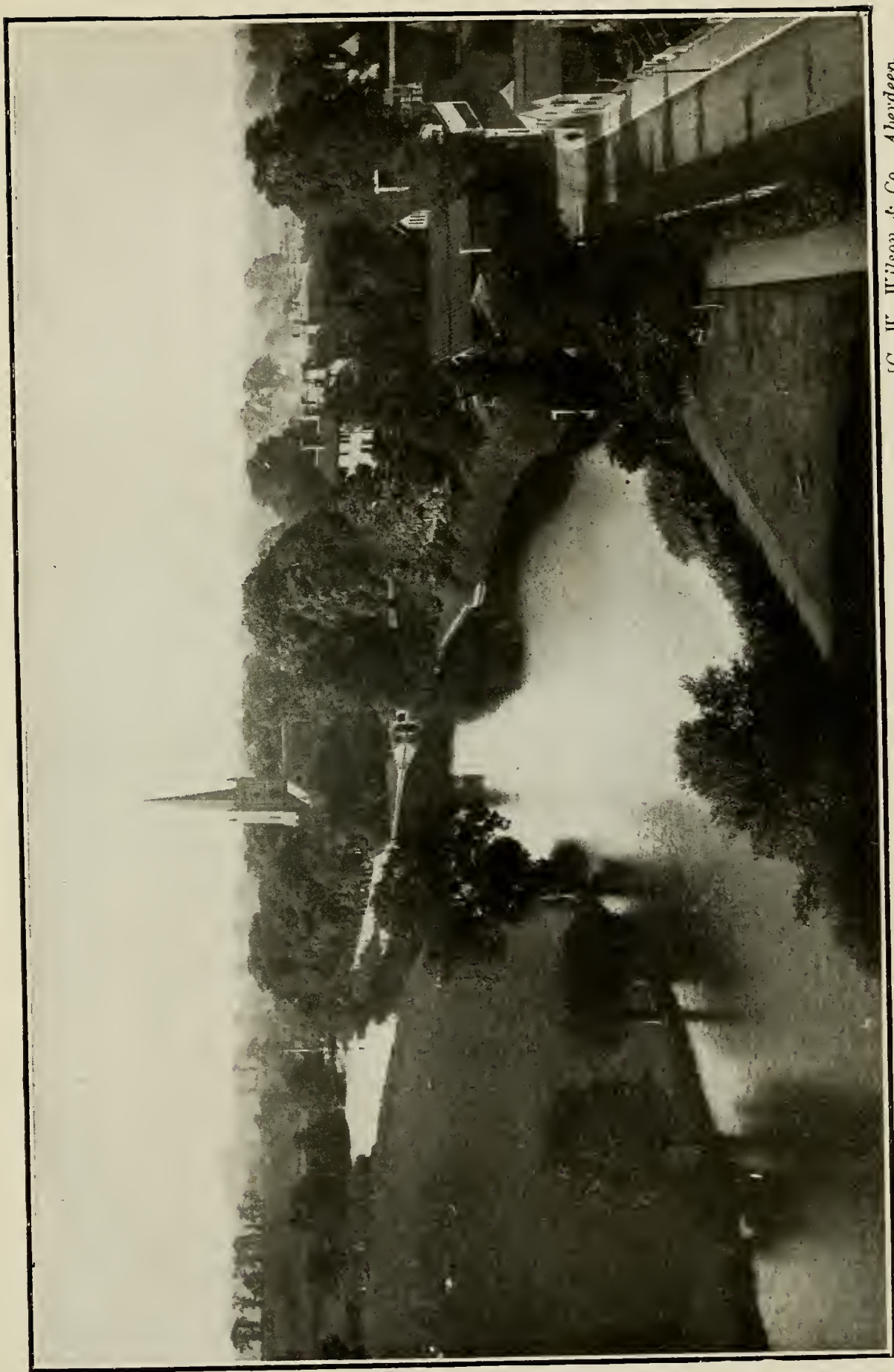
You will see in Fig. 94 that the Trent, the Severn, and the Warwick Avon make a triangle of rivers. Many important towns stand on their banks, but Birmingham does not. On the Severn we have Shrewsbury, Worcester, and Gloucester. On the Avon we have Rugby, Leamington, Warwick, and Stratford. Shakespeare was born and died at Stratford-on-Avon (see Plate XIX). On the Trent and its tributaries are Stafford, Derby, Leicester, and Nottingham.

But Birmingham is placed on higher ground away from the river banks. It is the only large city of the United Kingdom which is so situated. You may look over the map and see for yourself that this is so.

Birmingham is just inside Warwickshire, but lies near the end of the coalfield of South Staffordshire. At the other end of this coalfield is Wolverhampton, and between Birmingham and Wolverhampton is the Black Country, teeming with people, and black because the smoke of the factories kills the vegetation. There is a whole group of towns in the Black Country, but Birmingham and Wolverhampton are the largest.

At the other end of Staffordshire, on a part of the plain rising to the foot of the Peak, is the North Staffordshire coalfield, and upon it a group





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XIX. STRATFORD ON-AVON.

[G. W. Wilson & Co., Aberdeen.



XX. SOUTH-WESTERN ENGLAND, PHYSICAL.



of towns of which Stoke and Hanley are the chief. These towns are engaged in the making of earthenware, and the district is therefore described as the Potteries.

The best kind of clay, called kaolin, is used for making china ware. It is the soil produced by the decay of the rock known as granite. There is much granite in Cornwall and Devonshire, and kaolin is brought by ship from those counties to the Mersey, and is then carried by barges through canals to the Potteries.

North-westward from Birmingham a broad belt of the plain passes between the Welsh Uplands and the Peak into Cheshire, and so to the south-eastern corner of the Irish Sea. This low passage between Wales and the Peak is known as the Midland Gate. It is of great importance. Think how costly railway traffic between London and Liverpool would have been if the Moors had extended right across from the Peak into Wales. As it is, however, one of the most level lines of railway in England is the London and North-Western line from London to Liverpool and Manchester. As you travel through Cheshire on a very clear day, you may see across the plain to your right hand the Pennine Hills, and to your left hand the Welsh Hills (See Plate XXV, p. 258).

The Cheshire plain receives much moisture from the winds which blow from the neighbouring sea. It has, therefore, very rich meadows and



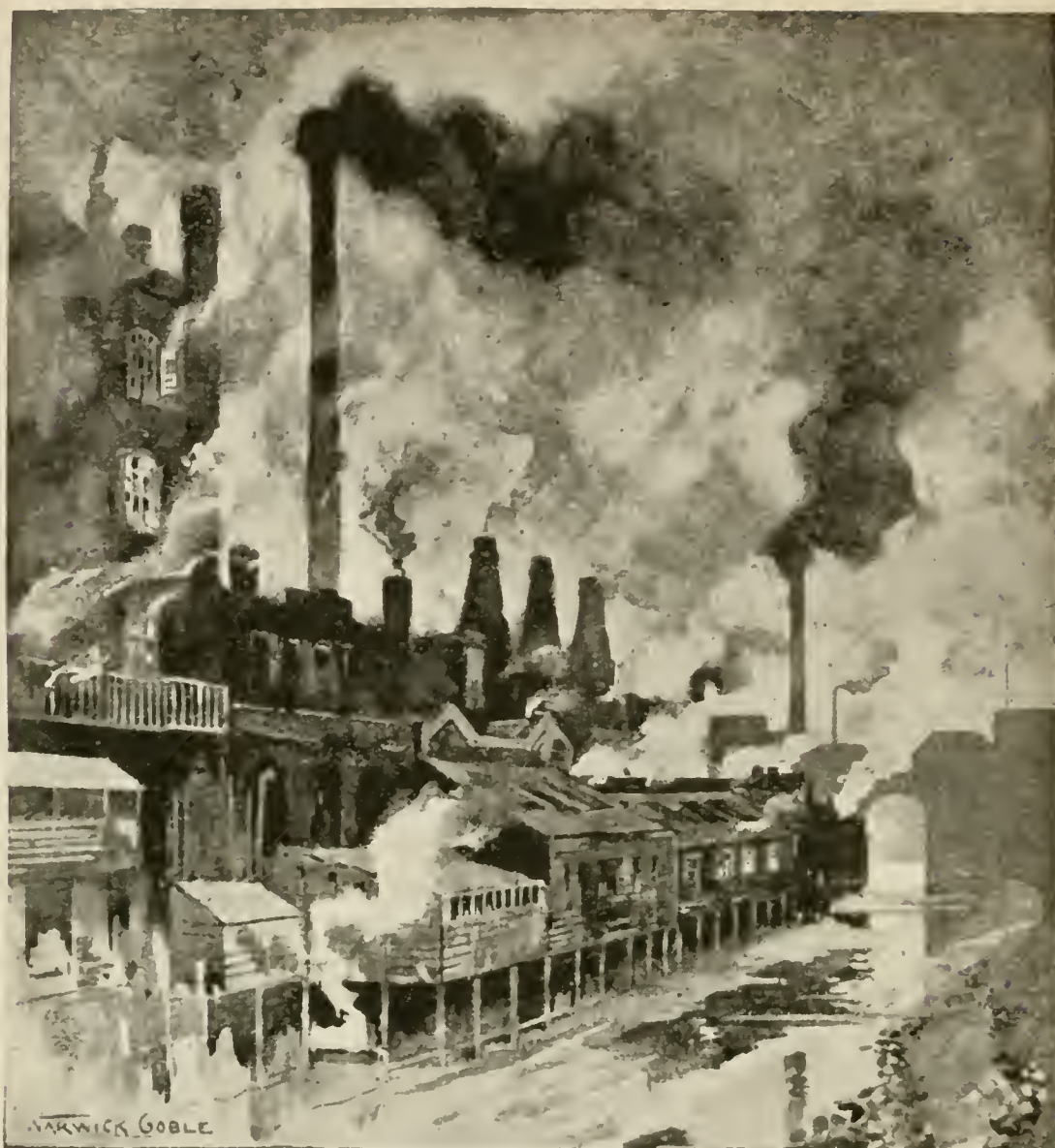


FIG. 95.—THE BLACK COUNTRY.

supports many cattle. Every one has heard of Cheshire cheese. But the wealth of Cheshire consists not only of grass and cows. Beneath its rocks are thick beds of salt.

Water is sent down to this salt through borings, and the brine which it forms by dissolving the salt is pumped up again to the surface. The

water in the brine is then evaporated by heat, and the salt is thus recovered.

In this way large masses of salt are gradually removed from beneath the plain, and hollows are left and the surface often falls in. Everywhere in the towns of this district traces are to be seen of the ruin caused by the sinking of the ground. The houses and chimneys are tilted in all directions. Even the floors of the houses are not level, and occasionally the tall chimney of a factory collapses. None the less, people go on pumping out the brine, because the salt is valuable.

## CHAPTER XXXII. THE EAST OF ENGLAND

FROM the Vale of York south-eastward to Norfolk and Suffolk is the lowest large district in Britain. It is lower even than the Central Plain of Ireland. This district is known as the East of England. Its coastline is broken by the two great estuaries, the Humber and the Wash. It consists of the large counties of Suffolk, Norfolk, and Lincolnshire, together with the East Riding of Yorkshire, and a group of smaller counties round the head of the Wash (compare Plates XXVIII and IV, pp. 275, 52).

The district south and west of the Wash is a remarkable tract of land as level as a table. It is known as the Fens, and extends from the Wash halfway to London, with the slightly higher ground of Norfolk and Suffolk to the east.

The Fens are crossed by drains in straight lines, which are little less than rivers in size, and are contained by high green banks. There are no hedges, but countless ditches in their stead, which are marked by long waving lines of sedge. The trees are few, except the pollard willows. The



remote horizon, the dome of the sky, and here and there a homestead, form the rest of the landscape. On bright summer days there is often a certain grandeur about this country, because of the far-spreading sea of crops and meadow.

At one time the Wash must have extended over all the Fens, but the sea has been banked out, and the marsh which was left has been drained. The soil is a black, very fertile peat which grows the finest root crops, such as mangolds and turnips, for the fattening of sheep.

It was in the midst of the Fen Marshes that Hereward and his band of rebel Englishmen long defied the Normans under William the Conqueror. Hereward established himself in the Isle of Ely, which was then a real island. You remember that King Alfred took refuge in a small island in the marshes of Somerset.

There was a similar marshy district, though not so large as the Fens, round the head of the Humber where the Ouse and the Trent join. It was known as Hatfield Chase, but has now been drained like the other marshes of England, such as Solway Moss round the head of Solway Firth, and Sedgemoor in Somerset. In the Humber marshes was the Isle of Axholme.

These marsh-lands are now some of the most productive parts of our country, but they are liable to be flooded, for they lie below the level of

high water, and the banks of the rivers sometimes burst in times of great rain or very high tide, especially if their repair has been neglected.

The rest of the east of England is the chief wheat and barley district of Britain. These crops are, of course, grown elsewhere, but not over so wide a space as here.

The largest markets for English wheat and barley are in the east, at Norwich, Peterborough, Lincoln, Ipswich, and London. The reason is to be found in the climate of this part of the country, which is quite different from the climate of Ireland, and very different also from the bleak climate of the hilly districts of England.

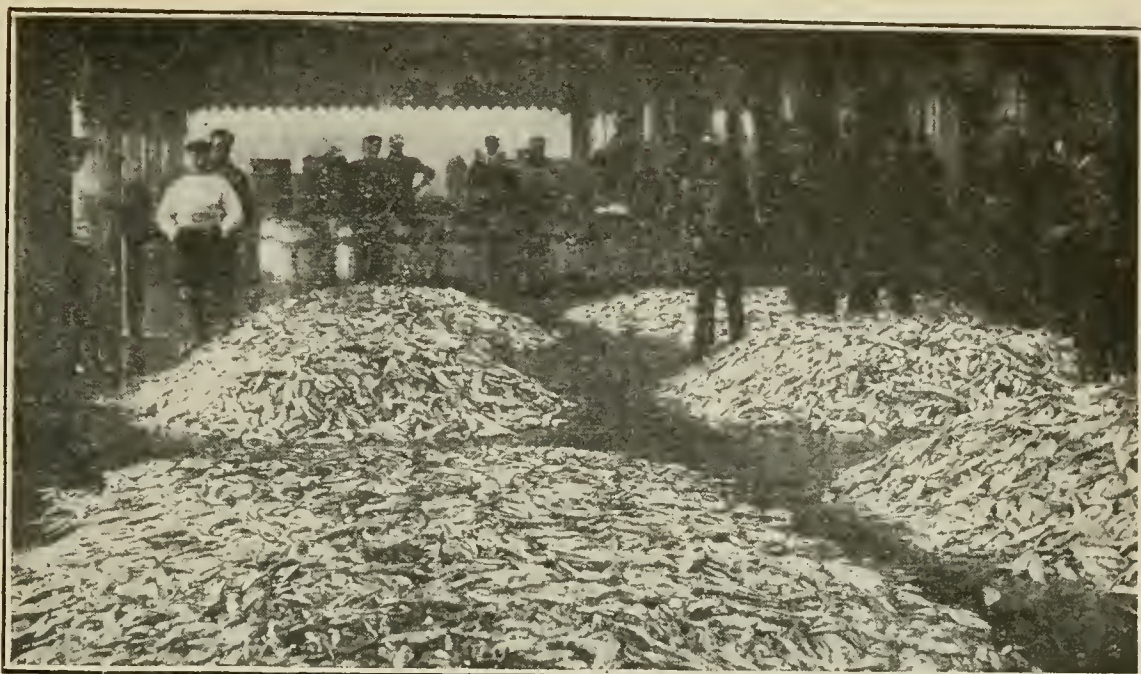


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FIG. 96.—A VIEW IN THE FENS NEAR SPALDING.





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FIG. 97.—FISH LANDED AT LOWESTOFT.

Just across the North Sea, which is here narrow, lies the kingdom of Holland, and thence the Continent spreads eastward for several thousand miles without any sea to supply moisture to the air. Therefore the east wind does not bring much rain to Norfolk. Most of the rain comes with the west and the south-west winds, but even these have had to cross the whole breadth of England, and if they blow exactly from the west, have had to cross Ireland as well. Therefore they have lost much moisture on the way.

But the greenness of Ireland is due not only to the abundance of rain, but also to the oceanic character of the climate, or, in other words, to the mild winters and the cool summers. Here in the



East of England, far away from the great Atlantic, the summers are comparatively hot and the winters cold. Now it matters not to wheat and barley if the winters be cold, provided the summers be hot and dry. Therefore it is that most British wheat and barley are grown in the East of England.

We do not grow all the wheat that we require for our large population, but we used to grow much more than we do now. In the last thirty or forty years men have learned to build very large steamers which carry grain cheaply, and therefore we bring four-fifths of our wheat from certain lands across the ocean. These lands have climates better suited than the climate of the west and north of Britain for the growing of wheat, although often not so well suited for other crops.

In addition to wheat and barley, the Eastern Counties have great fisheries. Many of the boats which fish upon the Dogger Bank remain at sea for days and weeks together. The fish is collected from them by rapid steamboats, and brought to Grimsby, Yarmouth, and Lowestoft, whence express trains carry it, while yet fresh, to London and to the great manufacturing towns of the North and Midlands of England.



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FIG. 98.—STONEHENGE.

## CHAPTER XXXIII. THE SOUTH OF ENGLAND

THE part of the country which lies south of the Thames is known as the South of England, although it does not lie so far south as the peninsula which is called the West of England. The South of England contains the seven counties, Kent, Surrey, Sussex, Hampshire, Berkshire, Wiltshire, and Dorset.

It is one of the most interesting parts of Britain, because it approaches nearest to the Continent, and throughout our history has had most to do with foreigners. But to-day Liverpool also sees much of foreigners, because there is now a great traffic on the ocean, as well as on the narrow seas.

The South of England is a part of the plain of England. It has no mountains, yet is not quite flat like the Fens. Low lines of hill cross its surface, and some of its districts rise a little above the general level and form low tablelands. In the county of Wilts there is a tableland of this kind which is known as Salisbury Plain. It



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FIG. 99.—BEACHY HEAD.

spreads for many miles and is made of a soft white limestone called chalk.

The rain which falls on Salisbury Plain sinks down through cracks in the chalk, so that the ground is dry and is covered with short grass fit only for sheep.

On this lonely tableland stands the remarkable monument of Stonehenge, a circle of huge stones each two or three times as high as a man. It was built probably for a temple, by some ancient race now forgotten, for we have no written record about it. The city of Salisbury, with its beautiful cathedral, stands down in a valley with the chalk tableland rising on either side.



This low chalk tableland spreads on from Wiltshire into the north of Hampshire, where the city of Winchester stands in another valley. Then it divides into two ranges of chalk hills known as the South Downs and the North Downs.

The South Downs extend through Sussex to end in the white chalk cliffs of Beachy Head. The North Downs run through Surrey, and then through Kent, to the white chalk cliffs of the South Foreland near Dover.

Part of the chalk of Kent bends down underneath a belt of clays and sands, and then rises again in the Isle of Thanet to form the white cliffs of the



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FIG. 100.—A KENTISH HOP GARDEN.

North Foreland. Therefore as you steam on the sea round the south-east coast of England you pass under three white headlands, the North Foreland, the South Foreland, and Beachy Head.

The Isle of Thanet is now part of the mainland of England, but in Roman times a sea strait cut it off from Kent, and it was then a real island. Ships coming from France to London passed through this strait and not round the North Foreland. But the strait has since been silted up by sand from the Stour, the little river which flows past Canterbury.

Between the North and the South Downs, in the counties of Surrey, Kent, and Sussex, there is a broad district, hilly in the centre but level in many parts, which is called the Weald. This word in the language of the Saxons meant Forest, and to-day if you look southward over the Weald from the top of the North Downs, or northward from the top of the South Downs, you see that this part of the country has still many trees. In the summer, when they are leafy, it might from a distance yet be thought a forest.

Only 200 years ago the chief iron manufactures of England were in the Weald, for the sandstones of which its central hills are formed contain much iron, and the forest around supplied charcoal for fuel. In those days men had not yet learned how to smelt iron with coal. The



palings round St. Paul's Cathedral in London were made of Sussex iron.

Hop gardens are another striking feature of the Weald. In the middle of summer, just before the hops are gathered, they are very beautiful. Whole fields are thickly covered with hop vines twining up posts to more than the height of a man, and crossing from post to post upon strings. From outside, the whole field looks to be one solid block of green, through which there run leafy tunnels.

At the east end of the Weald, along part of the low coast between the South Foreland and Beachy Head, is Romney Marsh, a flat district which was long ago drained, and now supports many sheep. A shingle beach has been heaped up by the waves along the front of Romney Marsh, in such a way that it stands out from the coast as a low promontory called Dungeness.

The land is here so low that as you approach it in a ship you often cannot see it, and the church towers and the lighthouse at the end of Dungeness appear to rise out of the sea. Therefore, although Dungeness looks upon the map to be something like the North and South Forelands and Beachy Head, it is really very different.

Out at sea, off the east coast of Kent, are the Goodwin Sands, once probably an island, but now covered at high tide. Ships are sometimes wrecked upon them in stormy weather.



Between the Goodwin Sands and the coast of Kent there is a sea passage, which is never very rough, even when the east wind blows, because the waves break outside on the Goodwin Sands. This passage is called the Downs, and when the winds are contrary, sailing ships often anchor here.

Formerly, when the war fleets of England were driven by wind and not by steam, the Channel Fleet often lay in the Downs and took orders from the Admiralty in London through Deal, which is a town on the coast of Kent between the North and South Forelands.

There is a third range of chalk hills which branches from Salisbury Plain. This curves through the west end of Dorset, and then runs eastward along the south coast, to form a white promontory, Purbeck, projecting towards the Isle of Wight. The range is renewed in the Isle of Wight, which it crosses completely, so that both the western and the eastern capes of that island are cliffs of white chalk. Off the western cape are some celebrated chalk rocks, known as The Needles.

The Isle of Wight is a fertile spot, and is therefore often described as the Garden of England. It has a warm bright climate, especially in the south, and is resorted to by invalids. Of more importance, however, is the fact that, unlike Thanet, the strait separating it from the mainland has not been silted up. This strait is known

in different parts as the Solent and Spithead. Ocean shipping has therefore calm access to the great commercial port of Southampton, while the Navy is able to lie in the sheltered channel off the dockyard of Portsmouth.



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FIG. 101.—THE NEEDLES.

Near the western end of Dorset a great cliff-edged hill rises like an island from the sea. This is the Isle of Portland. It is made not of soft chalk, but of a fine building stone called Portland stone. Portland is however no longer an island, but is attached to the mainland by a shingle beach like that of Dungeness.

Under the lee of Portland is Weymouth, a



pleasure town by the seaside, and also a port from which steamers run nightly to the Channel Islands. These islands belong to Britain, though they are off the coast of France.

We describe Weymouth as being under the lee of Portland, because it lies at its north-eastern foot, and is thus sheltered from the storms which drive up the Channel from the Atlantic. A great breakwater has been built upon the bed of the sea at Portland, like the breakwater at Plymouth, and behind this the Channel Fleet often anchors in a safe harbour.

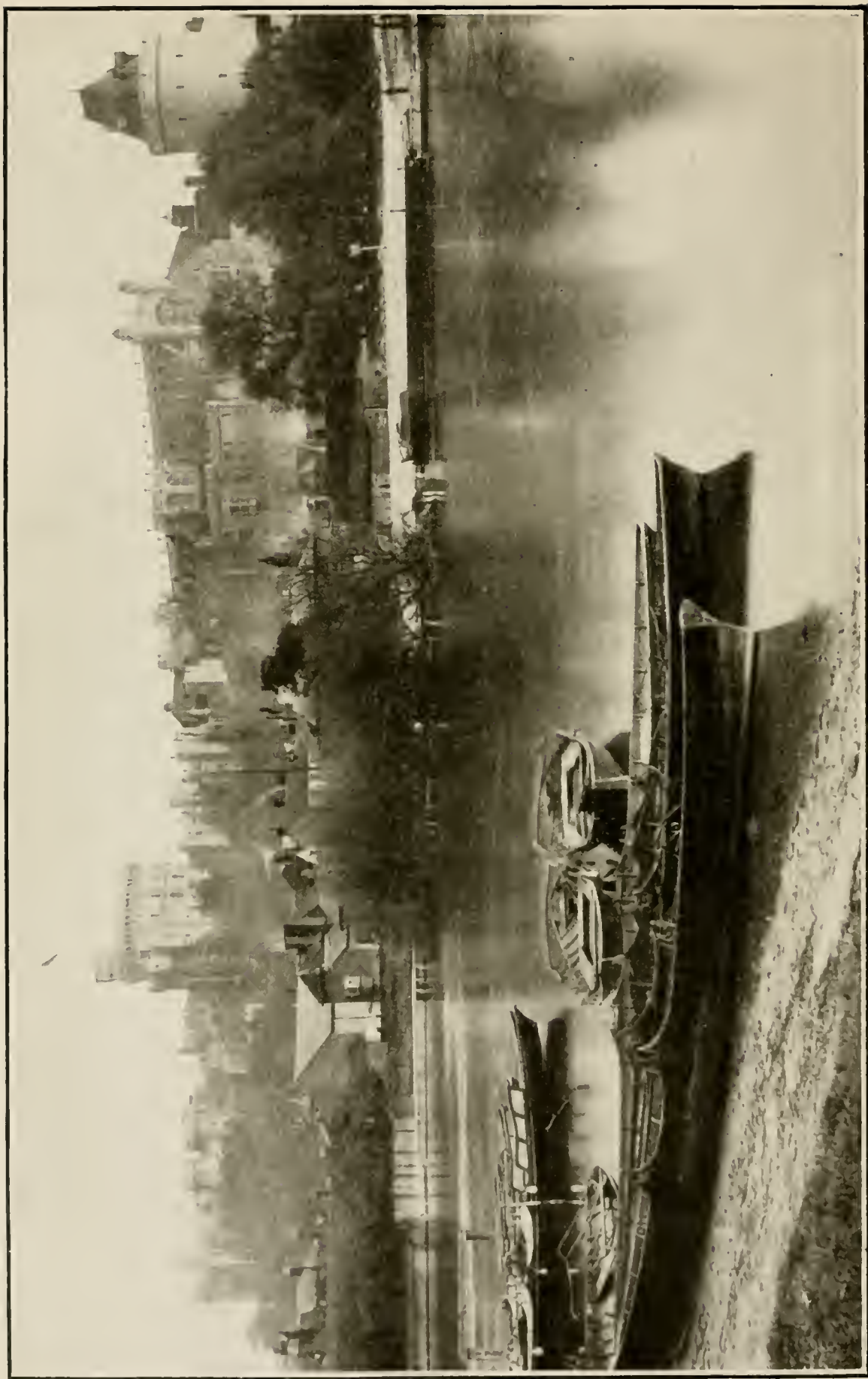
East of the Isle of Wight the seaside towns succeed one another right round the coast to the Thames estuary. Some of them are pleasure resorts for the people of London, and others are ports from which the steamers cross the Channel to France and Belgium. By far the largest of them is Brighton, but Eastbourne, Hastings, Folkestone, Dover, Ramsgate, and Margate are all important. The greatest number of the Continental passengers leave and enter by Dover, because the sea passage is there shortest.

A large harbour is being made at Dover by means of breakwaters. When it is finished, Dover will become an anchorage place for the Channel Fleet, like Portland and Plymouth. It is already a calling place for oceanic steamers, like Queenstown in Ireland.





XXI. SOUTH-EASTERN ENGLAND, PHYSICAL.



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XXII WINDSOR CASTLE.

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## CHAPTER XXXIV. THE THAMES

IF you stand high on the western brink of the Cotswold Hills in Gloucestershire, you see a broad fertile valley several hundred feet below you. Twenty miles away to the west, on the far side of this valley, is the beautiful jagged outline of the Malvern Hills, and midway you may often detect the silvery bends of the Severn River. Behind the Malverns in very clear weather is the dark edge of the Welsh mountains. All this you may imagine from your map, if you find the Cotswold Hills.

Now turn your back on the western landscape, and walk over the flat top of the Cotswolds for a mile or two, till you come to little rills of water flowing eastward. These are the sources of the Thames. They begin in springs where the water bubbles up from the ground. You must remember that all the rainwater does not flow off the surface of the land, but some of it filters down, and having journeyed for a time underground, rises again here and there as a spring. Even in dry weather the springs keep the river supplied with water which fell as snow and rain perhaps months beforehand.

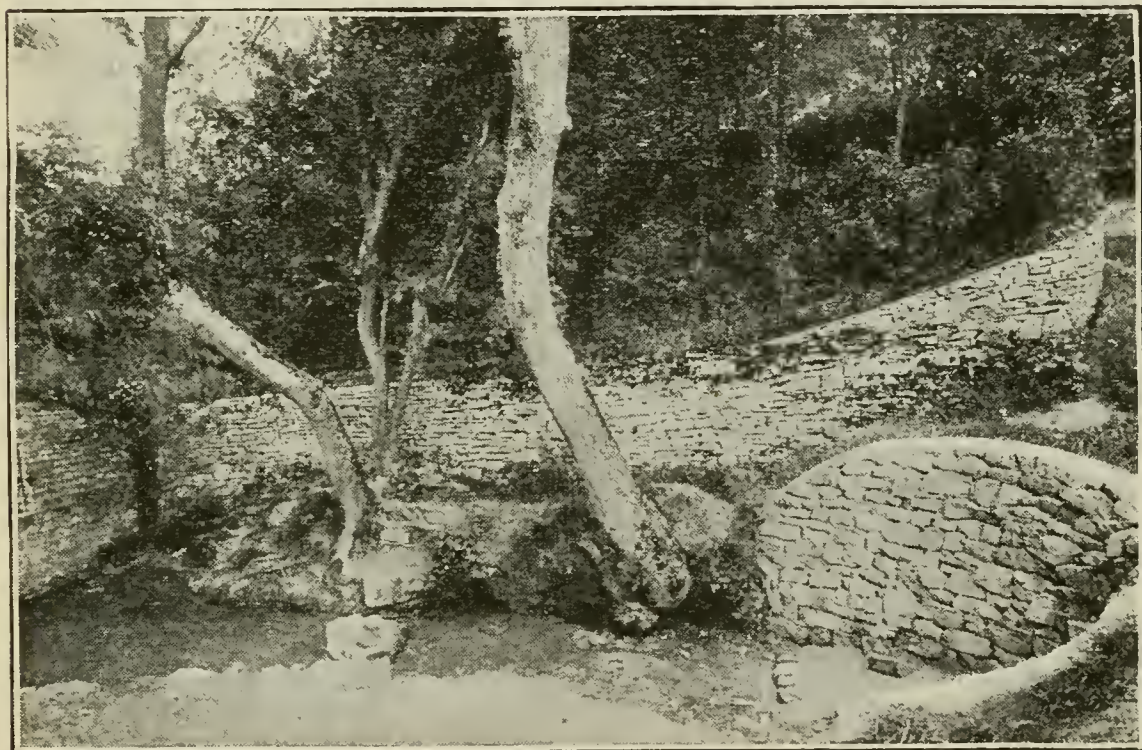


The little streams join together into larger and larger channels, and at last gather into the river Thames, where it flows through the lower country beyond the eastern edge of the Cotswolds. Here, at a point where the Cherwell tributary enters, is the city of Oxford (Plate XXIV, p. 243). The syllable "ford" at the end of the name tells you that in early days, before the Thames had been deepened by locks, and bridges had become necessary, there was a ford here, or shallow place with a firm bottom, by which men crossed over between north and south.

Many paths led to the ford from all the country round, and the place was therefore convenient for a market. To supply the needs of travellers, and of the market people, a village grew up beside the ford, which presently became a small town. Later, because the times were rough, a wall was put round the town. Then tradesmen from far and wide sought security within its bounds, and it became a city. Being placed upon the Thames, the city could be reached by boat from London, and in a time when there were no good roads in the country this was a very important fact, which must have helped to further increase the wealth of the place. In some such way as this Oxford was founded and grew.

At a later time it happened that, for reasons not known, since we have no written record, the

schools of Oxford became very famous, and joined together to make a University, which has continued until our own time, and has been made more beautiful in each successive generation. The other old University of England is Cambridge, at the southern point of the Fens, due north of London. The one was the University of the West, and the other of the East.



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FIG. 102.—SOURCE OF THE THAMES IN THE COTSWOLD HILLS.

Note the walls roughly built of limestone. The Cotswolds are formed of limestone. Such walls take the place of hedges in many hilly parts of Britain.

Below Oxford the Thames passes by a gap, like that of the Shannon at Castle Connell, through a range of chalk hills known as the Chilterns. These





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FIG. 103.—HIGH STREET, OXFORD.

The buildings to right and left are two of the colleges.

hills run north-eastward towards Suffolk from Salisbury Plain. You see, therefore, that Salisbury Plain is like the palm of a great hand, from which four fingers run out, the first through Dorset and the Isle of Wight, the second through the South Downs, the third through the North Downs, and the fourth through the Chiltern Hills. But there is no thumb.



East of the gap in the Chiltern Hills is the town of Reading, where the Kennet tributary joins the Thames, and a road and railway from the Kennet valley enter the main valley. Then we come to Windsor, where there is the King's castle, placed on a hill beside the river (Plate XXII, p. 227).

At last we approach the vast metropolis of London, through the midst of which the Thames flows in a channel that is broad and tidal. Below London on the south bank are Greenwich and then Woolwich, with the great arsenal where the guns are made for the Navy and Army. As it



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FIG. 104.—KING'S COLLEGE, CAMBRIDGE.

passes Gravesend the Thames is nearly a mile broad, and here the ships wait for the tide which is to carry them up to London. It is a fine sight to see them anchored just before the tide turns ; there are often as many as 700 vessels, large and small, which pass Gravesend upward and downward in the course of a day.

Finally we reach the Nore Lightship, where the river broadens out to the sea, and here its largest tributary, the Medway, comes in from the south. The mouth of the Medway is a harbour, which is utilized at Chatham for the third great dockyard of the Navy. You will remember that the other two are at Portsmouth and Devonport.

Although the Thames is but a small river when compared with the rivers of the continents, yet on account of the considerable rise and fall of its tides, it has a large estuary, which has served London for a harbour. The tide runs up for more than sixty miles to Teddington, and rises and falls more than twenty feet at London Bridge. London is the greatest port in the world.

In Plate XXIV we see the Thames basin. A line could be drawn round it in the same way as round the basin of the Yorkshire Ouse. You will remember how that was done when we were reading the First Part of this book (p. 50).

This map shows you very plainly the gap in the Chalk Hills through which the Thames flows,

between Oxford and Reading. Do you see, moreover, how the tributaries come to the Thames out of the Weald by a number of gaps in the North Downs? The roads gather to these gaps to pass through them and so avoid the toilsome climb over the hills. Market towns, such as Guildford and Dorking and Maidstone, have grown up where the roads join, for the same reasons that Oxford grew, as we saw just now, where the roads gathered to a ford in the Thames. Do you remember from the First Part of the book, how Inverness and Aberdeen became large towns? Is there, do you think, any town in your neighbourhood which grew in that way?

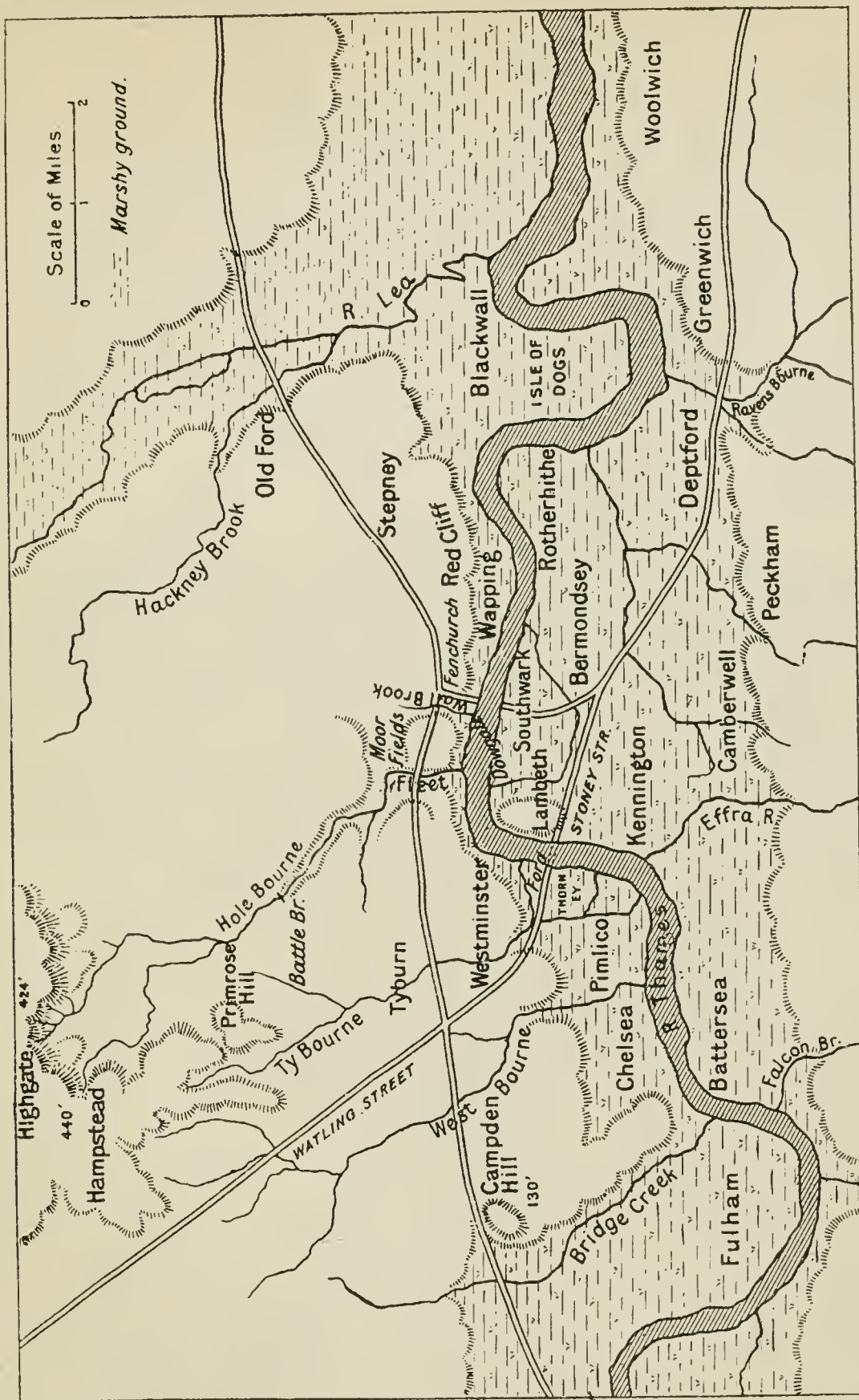


## CHAPTER XXXV—LONDON

HAVE you ever thought what London must have looked like before the houses were built? Look at Fig. 105. Do you see how the Thames flows from Fulham to Woolwich, making great bends, but keeping on the whole an easterly course? It swings from side to side of a broad valley, whose edges are marked on the map by hill shading. If you measure it, you will see that this valley is generally two or three miles across.

The bottom is flat, and was once marshy, and all covered with green reeds and tall grass. In the old days a sudden fall of rain in the hills, or a high tide from the sea, was enough to flood the whole of it.

Look again at Fig. 105, and notice a rather narrower valley coming from the north, which also had a marshy bottom, with the more solid ground rising from it on either hand. The River Lea, a tributary of the Thames, flows through this strip of marsh (Plate XXIV, p. 243). Let us measure the breadth of the Lea Valley.





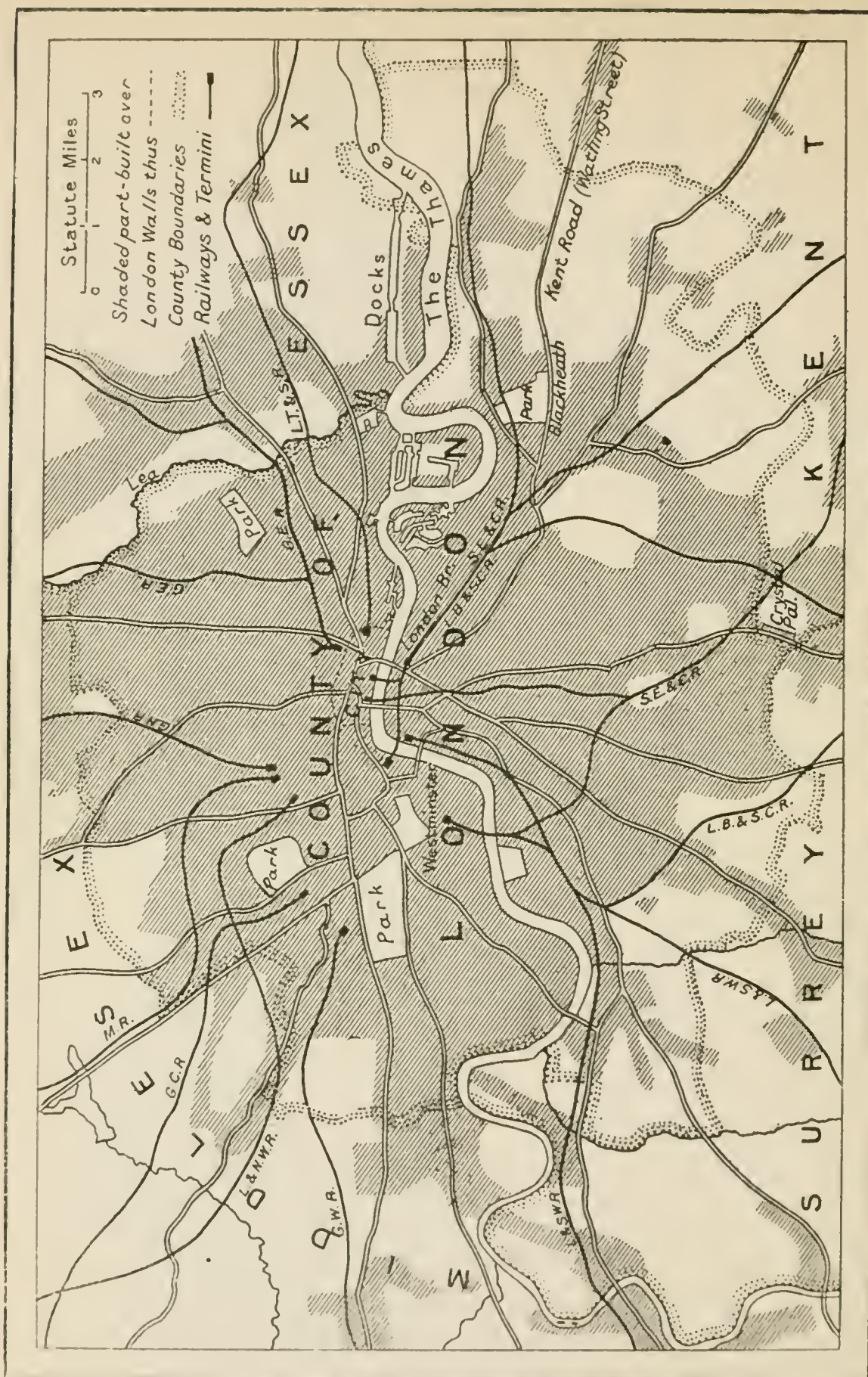


FIG. 106.—COUNTY OF LONDON.



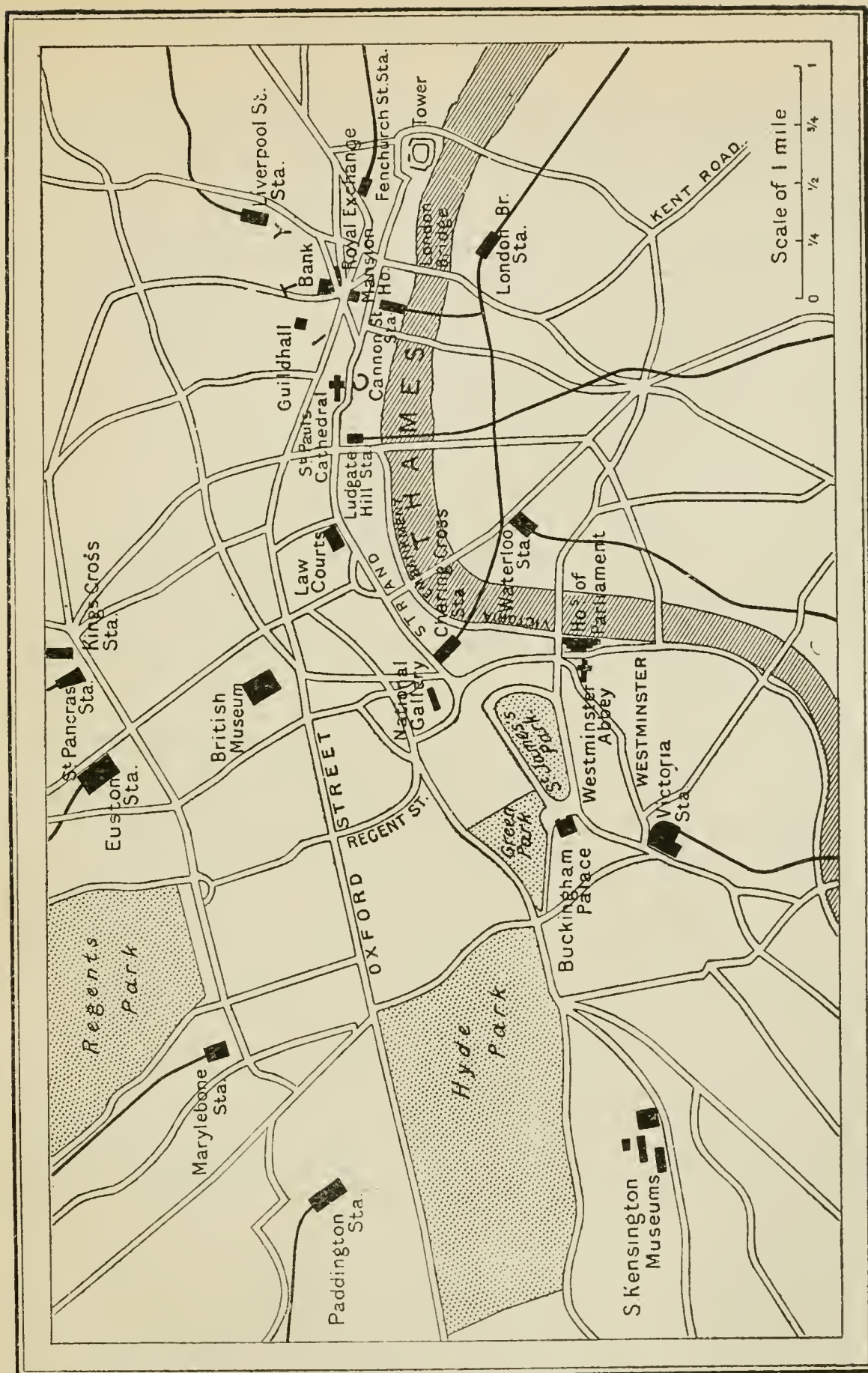


FIG. 107.—CENTRAL LONDON.

All the ground not shown as marsh on Fig. 105 was raised a little above the valleys of the Thames and Lea, and most of it was clothed with trees. We still have remains of these woods in Epping and Hainault Forests, east of the Lea. There were once bears, and wolves, and wild oxen, and deer hiding in the green glades.

If you look next at Fig. 106, you will see some marks of this old London before houses. Do you notice the spaces labelled "park"? These are pieces of the open country which have never been built upon. London has gradually spread round them. Measure the length and breadth of Hyde Park in Fig. 107.

Then turn back to Fig. 106, and notice the shaded portions which show the extent of the houses and streets. Do you see that there is very little building in the Lea Valley? That is because of the marshy nature of the ground. West Ham and Leyton have been built in Essex, chiefly beyond the marsh.

But in the Thames Valley the land near the centre of London became so valuable in later times, that Southwark and other towns on the Surrey side had to be built on ground which was liable to flooding.

In Fig. 106 you will notice the docks in connexion with the river. There was not space enough to put their names into the map, but if you live in

London your teacher will tell you about them. Now compare Figs. 106 and 105, and you will see that the docks have all been dug in the soft mud at Wapping, at Rotherhithe, in the Isle of Dogs, and in Essex beyond the Lea. It is the same with the Tilbury Docks opposite Gravesend.

Thus, if you think carefully, the parks and docks of London will tell you what the country was like on which London was built.

Look at Fig. 105 again, and imagine yourself on Greenwich Hill on a fine Sunday in the summer. We choose the summer and a Sunday, because there are then fewest smoky chimneys and the air is often clear. At the bottom of the hill is the bright, broad river coming to you, and then going away again as it rounds the Isle of Dogs. Away to the northeast are the dark hills of Waltham Forest, and northward is the Valley of the Lea.

North-westward spreads out all London. In the middle distance, beyond several miles of houses, are the Tower Bridge, the dome of St. Paul's Cathedral, and the towers of Westminster. Behind these, as you see from Fig. 105, are hills more than 400 feet high. The little mark ' behind the numbers is a short way of writing "feet."

Now I want you to think about these hills in the north-west of London; but first measure how far they are from Greenwich, and remember that





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FIG. 108.—THE TOWER OF LONDON.

there are now houses all the way. From the top of Hampstead Heath, the highest of these north-western hills, you may look right across London to the dome of St. Paul's and the towers of Westminster, and away on the Surrey Hills beyond is the Crystal Palace sparkling in the sunshine.

Hampstead Heath is a hill made of sand, once covered, as its name tells you, with a low plant called heath, which is all purple with bloom in the early autumn. There were also, no doubt, green ferns and golden gorse, but there were no trees.

Before London was built this hill rose nakedly above the surrounding oak forests. The oak grows best on a clay soil, and London is built on clay, and even the bricks of its houses have been made from the clay. The great heap of sand which is called Hampstead Heath rests on the top of the London clay.

Do you see in Fig. 105 a number of streams rising in Hampstead and Highgate Hills, and flowing south-eastward to the Thames and the Lea? They are the West Bourne, and the Ty Bourne, and the Hole Bourne, and the Hackney Brook. They were just little sparkling brooks flowing in little green valleys winding through the forest.

The word "bourne" means brook. You have it in Bournemouth and Eastbourne, which are towns on the south coast.

Why do these streams rise in the Hampstead and Highgate Hills? Have you not heard that in the waterworks which supply large towns the water is often filtered through layers of sand? But clay, through which water will not filter, is often used in the banks and bottom of the reservoirs. So the rain which falls on Hampstead Heath



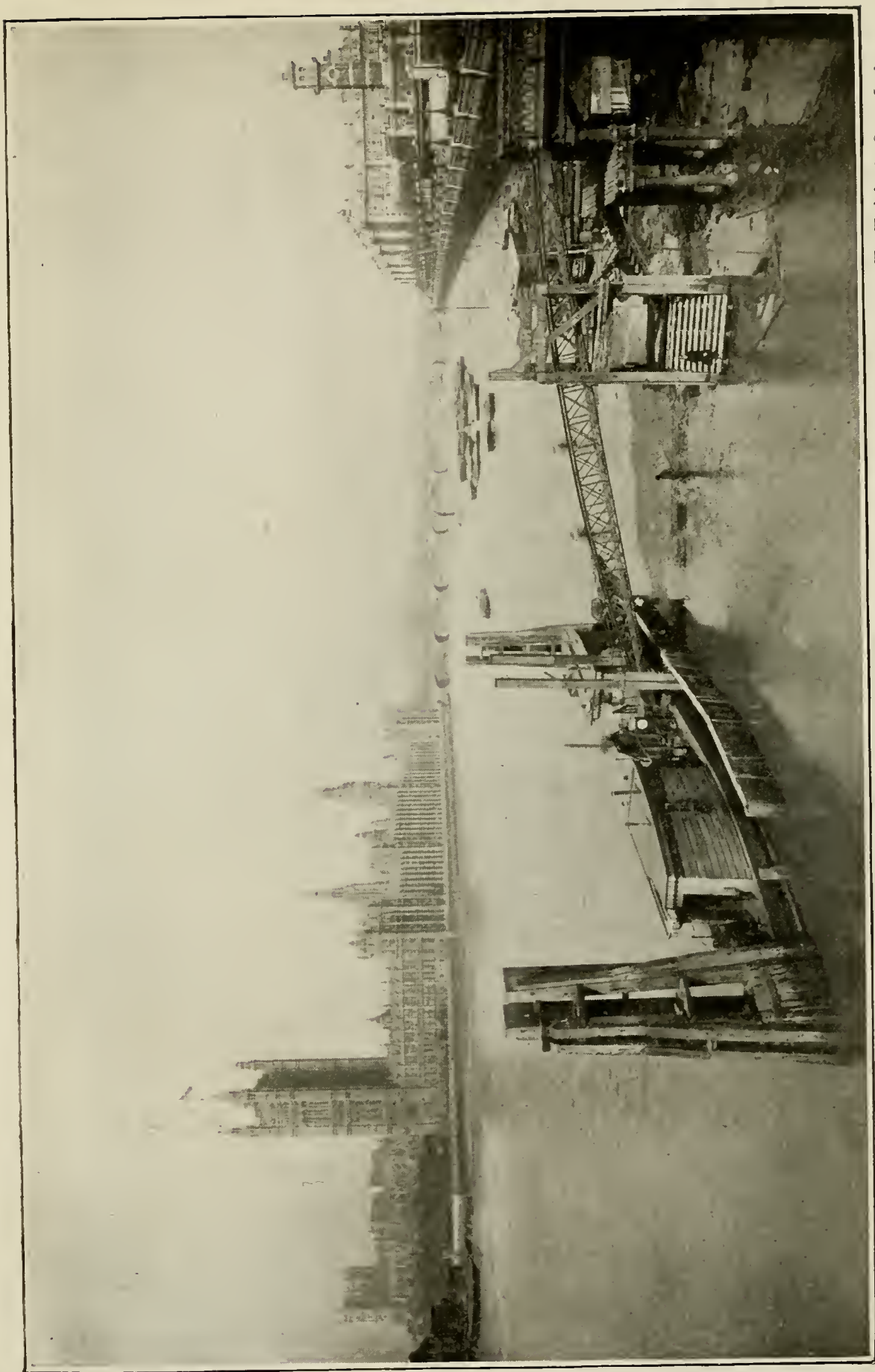
filters down through the sand, until it comes to the clay, and then, because it can sink no more, it oozes out all round the hill in a line of springs. These springs fill the Hampstead and Highgate ponds, and flow away to the Thames in the little streams we have just named.

A wall was built across the valley of the West Bourne in Hyde Park, and the water of the bourne was made to fill the valley—so forming a lake called the Serpentine. The Ty Bourne was used for the lake in Regent's Park, and the Hackney Brook for the lake in Victoria Park.

But the most interesting of these streams was the Hole Bourne, or, as it has been shortened, the Holborn. Near its mouth this stream was called the Fleet, a word which is got from the verb to "flow." You have, of course, heard the expression "fleet of foot." Fleet Street was the road leading from the west to a bridge over the Fleet brook. Look at Fig. 107. Do you see the straight road leading by a bridge over the Thames from Ludgate Hill station? On the north side of the Thames that road has been built over the Fleet, which now flows under it in a tunnel or sewer.

I want you to look very carefully on Fig. 105, at the ground shown just east of the Fleet. You see that it is solid ground and not marshy, though it is close to the Thames bank. It is in fact a hill, and up this hill now runs the street called

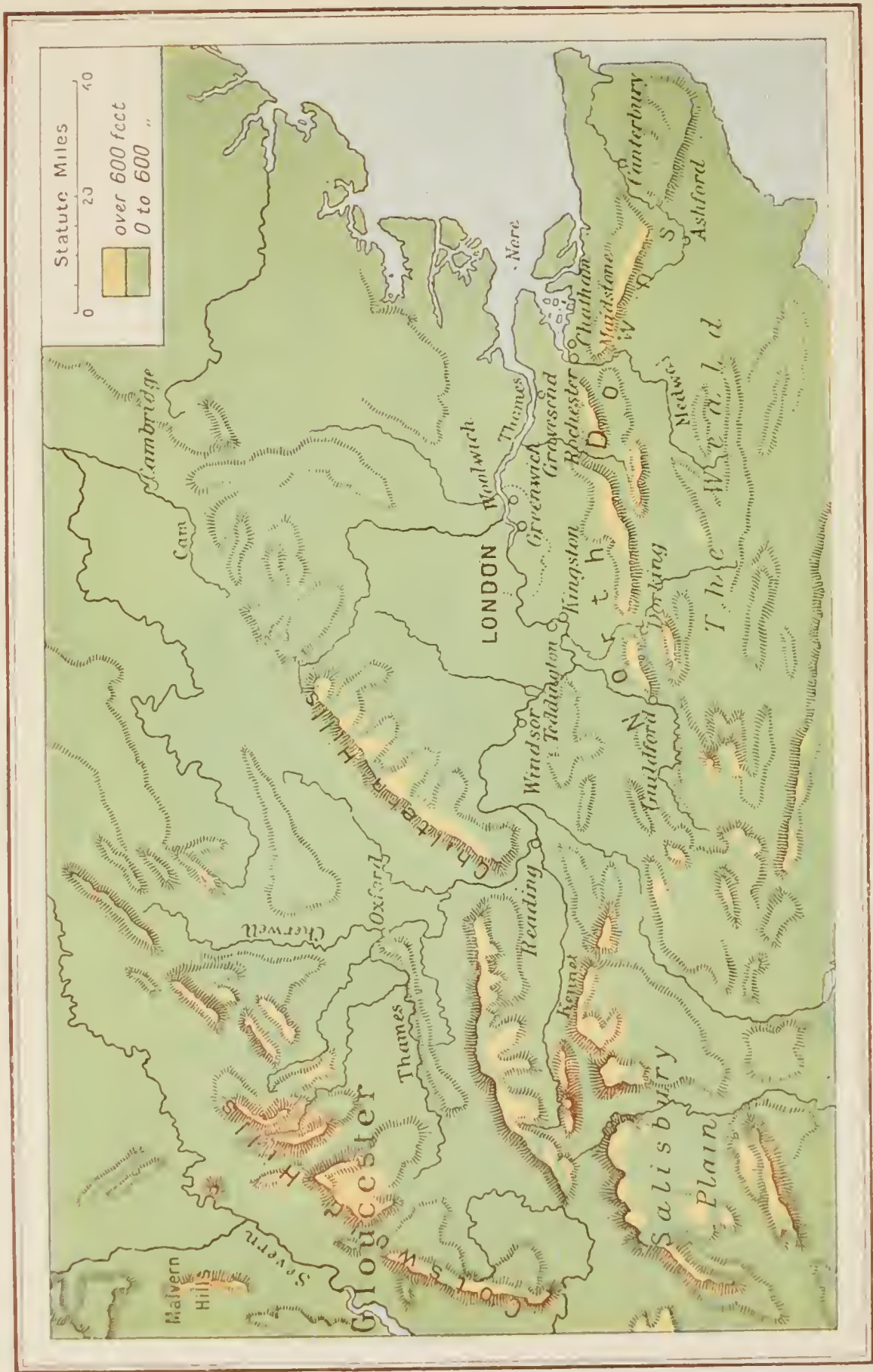




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XXIII. WESTMINSTER, FROM THE RIVER.

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XXIV. THE THAMES BASIN PHYSICAL.



Ludgate Hill, to St. Paul's Cathedral which is on the top. Here, and for about a mile and a half eastward, the Romans built the city of London. In this position they had firm ground for the foundations of their houses, and water at hand to drink, and their ships could come close up to the city to unload, for the mud did not extend as in other parts for hundreds of yards from the bank.

In later times a wall was built round London, the small London on the hilltop by the Fleet and the Thames. The gates in this wall had names still borne by the streets which once ran through them. You have now Aldgate Street, and Bishops-gate Street, and Aldersgate Street, and Newgate Street, and Ludgate Hill. But in the old days once you stepped outside the walls you were among the fields (see Fig. 105), and then you came to the woods.

Have you heard of the country boy, Dick Whittington, who ran away from the office of his master in London, and when he was tired and rested by the roadside, heard the bells of Bow Church ringing, "Turn again, Whittington, Lord Mayor of London"? And he turned back, and in after years became a very celebrated Lord Mayor, Sir Richard Whittington. Bow Church is in the very middle of the City, but in those days its bells could be heard in green woods and by stream-sides, where now for several miles there spread the houses and streets of London.



The chief building of this little city of London in the middle ages was the cathedral, a very large and beautiful church, with a tall spire like Salisbury (Fig. 115, p. 267). But this cathedral was burnt down in the Great Fire of London in the reign of Charles II. The present cathedral with a dome was put up by a very celebrated architect, Sir Christopher Wren.

Other buildings of old London were the Guildhall, or Town Hall, and the Mansion House, where the Lord Mayor lives. You should find these buildings in Fig. 107. You should also measure the size of the City on Fig. 106.

London was not always the capital of England. At first the capital was at Winchester. It was there that Alfred the Great reigned. But afterwards, when London had grown by its trade to be the largest city in England, it was found inconvenient for the King to live at a distance from it. So he came to live near London.

But he did not put his palace inside the walls, for the people of London were not always peaceable. William the Conqueror built a fortress beside them to keep them in order, and this fortress escaped the great fire. We have it still, and we call it the Tower of London.

Two miles up the river, but on the same side as the City, there was an island in the marsh which was called the Isle of Thorns, or Thorn-ey, for



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FIG. 109.—THE VICTORIA EMBANKMENT, WATERLOO BRIDGE, AND ST. PAUL'S CATHEDRAL.

“ey ” means island. Here the King built his palace, so that important people could come to him by boat from London, or he could go up the river to his castle at Windsor. You must remember that the roads were bad in those days.

Beside the palace was a great church, the King's Church, and this men called the West Minster to distinguish it from the East Minster, which was the cathedral of London. Thus it happened that the Palace also was called Westminster Palace.

At first the whole government of the country was carried on in the King's palace at Westminster. The Houses of Parliament met there, and the chief judges gave law there. Afterwards as the popula-





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FIG. 110.—THE BANK OF ENGLAND.

tion grew, and government was no longer a simple matter, more space had to be found. The King now lives at Buckingham Palace, and new courts have been built for the judges in the Strand (see Fig. 107).

The word “strand” means “shore.” It was the shore road from London to Westminster. Now it is one of the busiest streets in London.

London has grown very large in the last two or three centuries. You see in Fig. 106 how it spreads far beyond the old city. It has been made a separate county, which is managed by its own County Council. But as you will notice in Fig.



106, the houses have spread even beyond the county of London into the counties of Essex, Middlesex, Surrey, and Kent. There are not quite five million people in the county of London, but in the whole metropolis there are now seven millions.

Very few people except caretakers now sleep in the "City," which was once the whole of London, but a great many men and women crowd into it to their work, every morning except Sunday, and come away in the evening. In the City, therefore, are the chief business buildings, the Bank of England, where the money of the Government is kept, and the Royal Exchange where shipping business is dealt with.

Of late London has grown so vast that its inhabitants have lost much time in getting from one part to another. There are many bridges over the river and some fine broad streets, but the throng is too great for the speed of horse traffic. Men are at last overcoming the difficulty by electric tramways, and also by piercing tubes underground for the conveyance of electric trains.

These tubes are more easily made under London than under most cities, because London is built on the London clay, into which you can cut a hole almost as easily as you would through cheese. This is a very fortunate circumstance.

Finally let us not forget that London, because it is the capital, has the great privilege of housing

the national collections for the study of art, literature, and science. The National Gallery is one of the finest collections of pictures in the world. The British Museum has a library of more than a million books, and a splendid collection of sculptures brought from Egypt, and Greece, and Rome. The South Kensington Museums have wonderful collections of stuffed animals and birds. In all parts, moreover, there are Free Public Libraries. All these places may be visited without payment. Surely it is a disgrace to any Londoner if he grows up in ignorance.

## CHAPTER XXXVI.—THE METROPOLIS

DOES it not strike you as curious, if you look at the map of the British Isles, that London, the capital or metropolis of them, should be in the far south-eastern corner? Would it not seem more natural that the capital of the country should be near the centre—say at Liverpool? Why is it, then, that London in the south-east has become the capital?

To find the answer, we must consider the history of the British Isles. Remember that Scotland and Ireland, and even Wales, had not been joined to England at the time when William the Conqueror fought the battle of Hastings. But at that time London was already much the largest city in England. We have therefore first to think of London as the capital only of England.

But London is not even in the centre of England. Birmingham is far more central. How came it, then, that London was the capital even of England? To find the answer to this question, we must remember that the North of England contains the Pennine Moors and the Lake Mountains, and



that there were very few people living in the North until men began to use the coal which is found there to drive steam engines.



FIG. 111.—BRITISH ISLES, SHOWING POSITION OF LONDON.

Most of the people of England formerly lived in the great agricultural plain of the Midlands, the East, and the South. Now London is not so very far from the centre of this plain. Still, it is not quite in the centre; the town of Buckingham is nearer to that. Thus we are still left asking the question, "Why was London so early the most important town in England?"

The answer is to be found in the estuary of the Thames and in the promontory of Kent. In the old days people did not like crossing the sea. There were many pirates upon it; moreover, contrary winds often carried ships out of the way. So they naturally chose the shortest passage, and every one who wished to go to the Continent rode,

therefore, towards the south-eastern corner of the country.

On the way the river Thames had to be crossed. It was a much more difficult matter to build a bridge then than it is to-day, so that men were content with much fewer bridges. On the Lower Thames, until about 150 years ago, there was only one bridge below Kingston. It was called London Bridge.

The great road from the Continent, known as Watling Street, started from Dover (Plate XXI, p. 226). It crossed the river Stour at Canterbury, and the Medway at Rochester, and approached London over Blackheath, the common to south of Greenwich Park (Fig. 106, p. 236). Then descending Lewisham Hill, travellers forded the little river Ravensbourne at Deptford, and followed a way through the green marshes, now a busy street called the Old Kent Road, until they came to the bridge.

From London Bridge roads branched into all the country beyond—north-eastward to Ipswich and Norwich, northward to Lincoln and York, north-westward to Chester and Carlisle, and westward to Bristol. South of London, beyond the North Downs, lay the great forest of the Weald, which travellers avoided, if possible, because of the robbers who sheltered there, and because of the badness of its muddy lanes (Plate XXI). Even the road from the south-west, from

Southampton, did not go direct to London Bridge, but crossing the Thames at Staines, approached London on the north side of the river. You should look all these places out and draw the roads on a map. Then you will see why London became the great city of England.

London Bridge has been rebuilt more than once. The older bridges had a great many small arches, not as at present a few large ones. Therefore the ships which came up with the tide from the sea could not go beyond London Bridge, but must there discharge their cargoes. This was very convenient, because the goods could be forwarded



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FIG. 112.—LONDON BRIDGE.



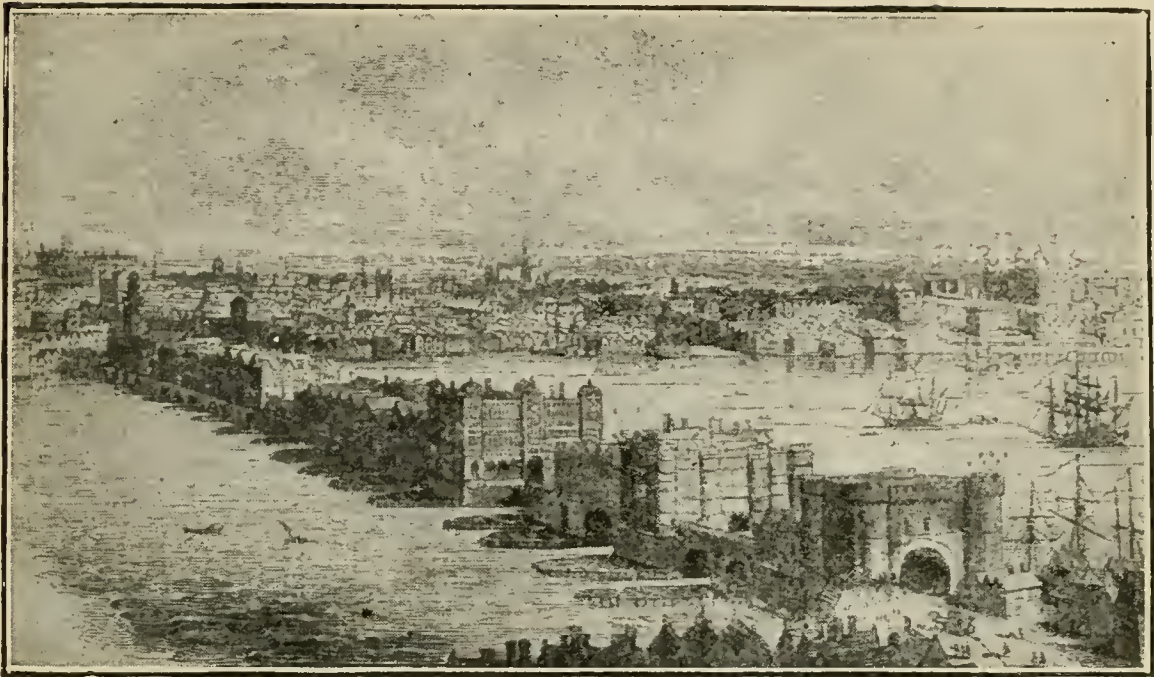


FIG. 113.—OLD LONDON BRIDGE.

Note the Tower and the ships below, but not above bridge.

by the roads which spread out from the bridge into all the country round. The roads from London were also used to bring in the wool, and other agricultural produce, of the fertile plain of England, in the midst of which London was placed.

Thus London grew to be a great city for three reasons :

- (1) It was on the tide-way of the Thames.
- (2) It was at the lowest bridge over the Thames.
- (3) It was surrounded by a fertile country.

You may still see how the great roads led out from London. The road to Ipswich, for instance, once crossed the marshes of the Lea at Old Ford. Then it was diverted to Stratford, which means

the Street-ford or paved ford, for the word street is got from the Latin word meaning a paved way.

On the same road you will find the word Bow, because here was a bridge with an arch. You know that you make a bow when you bend a ribbon to tie it.

Another way leading out of London was a continuation of the Kentish Watling Street, which must very early have crossed the Thames at Westminster by a Ford or Ferry (Fig. 105, p. 235). The Edgware Road is part of this old Watling Street, which you may see in Plate XXI, striking across the plain of England towards the Irish Sea.

Still another way led southward from London Bridge, and crossed the marshes on the Newington Causeway. You will remember the meaning of the word "causeway" from our description of the Giants' Causeway.

The railways which radiate from London are now much more important than the roads. But of them we shall speak in a later chapter.

Is the position of Edinburgh, in Scotland, or of Dublin, in Ireland, at all like that of London, in England ?

## CHAPTER XXXVII—PLACE-NAMES AND COUNTIES

WE have now travelled right through Britain. We have seen something of each part of it. Let us consider lastly some things which concern the whole country.

The names of places are among the most interesting facts in geography. There are a good many names on the maps in this book, but if you look at a really large map of England you will see some thousand of them.

If you live in the country, you know that every village round you has its own name, and if you live in a town, you know that every street has its name. These names are often much older than the houses now standing in the village, or in the street. One by one, the houses are pulled down and new houses are built in their place, but the name of the street generally continues, even though at the end of several lifetimes there be not one of the old houses left standing.

The name was generally given by people who came to the district before any village or street





FIG. 114.—EARLY BRITAIN.

had been built, and of course they named the place in their own language. You will remember that in the First Part of this book we learned that the French people speak of the Strait of Dover as the Pas de Calais.

Let us look first at some of the river names on the maps of Britain. There are two tributaries of the Severn which are both called Avon. We have to distinguish them, as you know, by speaking of one as the Warwick Avon and of the other as the Bristol Avon. There are still other rivers Avon in Britain. For example there is one in Wiltshire, which flows past Salisbury, and another in the north-east of Scotland.

Nor is this the only river name which is repeated again and again in different parts of the country. In the North of England we have the Yorkshire Ouse, and we have the Great Ouse flowing into the Wash, and the Little Ouse into the Great Ouse, There is an Ouse also in Sussex.

Why is it that we find so many rivers called by the same name? The reason is that in old times most people did not travel much, but passed all their lives in one small district. It was enough for them to say to their neighbours that they were going on "the river" when they went out in a boat, and it was not necessary for them to call the river by any special name, because every one knew what they meant.



Now some of these ancient people did not talk English, for they were British and spoke Celtic. To-day in the Celtic language of Wales the word for a river is "Avon," though it is spelt Afon. In Welsh men do not talk of the River Towey, or the River Teify, but they speak of Afon Towey and Afon Teify.

The word "Ouse" means water in Celtic. You can see at once, therefore, that when an ancient British farmer said he was going to drive his cattle to the water to drink, he would say that he was driving them to the Ouse. These names, Avon and Ouse, were given to English rivers by the Celts before they took refuge in the Highlands of Wales.

Most of the other river names in all parts of the United Kingdom are Celtic, but in the course of ages many of them have been changed and mispronounced by people who did not understand Celtic. Thus the name of the river Exe in Devonshire was once the same as Ouse, and meant, as we learnt some chapters back, simply "water."

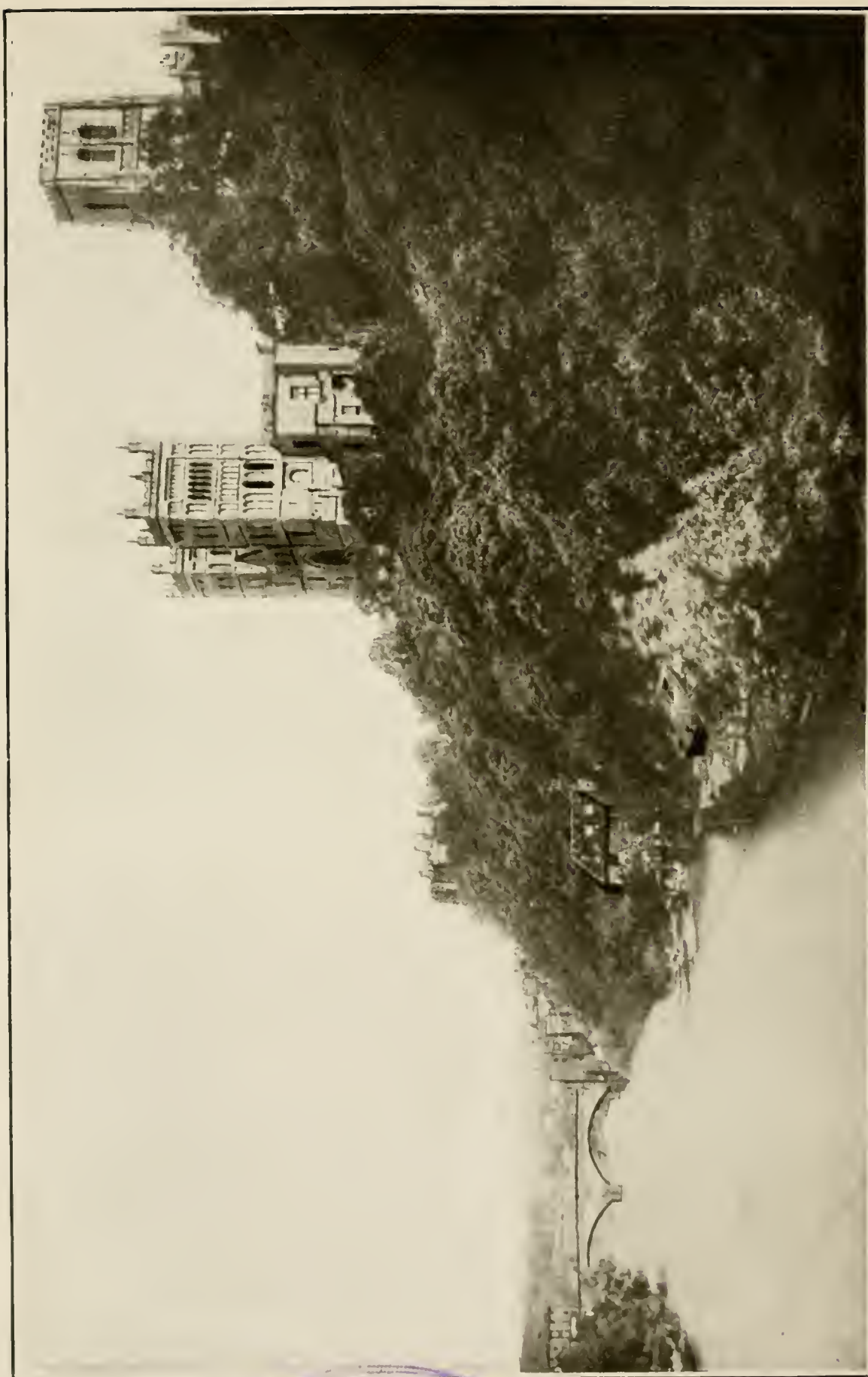
The words Severn, Trent, and Thames have been so changed that we do not now know their first meaning. We only know that they are names which have come down to us from Celtic times.

Now let us examine some town names. A few of them are Celtic. Inverness, for example, is





XXXV. CENTRAL ENGLAND, PHYSICAL.



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XXVI. DURHAM CATHEDRAL AND CASTLE.

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Celtic, and means, as we have already learnt, the town "at the mouth of the Ness." But these Celtic town names are mostly found in Scotland, Ireland, Wales, and Cornwall. There are not many of them in England. This is because the Angles and Saxons destroyed the Celtic villages and drove the Celts into Scotland and Wales.

Some of the oldest town names in England come down to us from the Romans. The Romans first visited Britain under their great general, Julius Cæsar. At a later time they came again and conquered England, Wales, and the south of Scotland, but they never conquered the Highlands of Scotland, nor yet Ireland.

The Romans held Britain by means of a Roman army and Roman governors, but many of the farmers and traders were still British. The Roman towns were fortified, and were connected with one another by fine straight roads along which troops could march with ease. Therefore most of the names which have come down to us from the Romans are those of fortresses and roads.

Now the Latin word for a fort is "castra," and this word, when mispronounced by some of the early English, became "caster." We have it to-day in Doncaster, which means the fort by the river Don. But others of the English pronounced the word "chester." In those days very few people could read or spell, so that names were mispronounced



in all kinds of ways. The name Chester we find on the river Dee, and also in many other town names, as, for example, in Manchester and Rochester.

Still others of the English pronounced the same word "cester," and so we find Worcester and Gloucester. And lastly, in the mouths of some people the word was reduced merely to "eter," and this is the form we have in Exeter.

If you go over the map of England you will be surprised to find how many places there are which were evidently Roman forts, since they contain the word *castra* in one form or another.

The Romans had to leave Britain when they had been here a little less than 400 years. Then there came over the North Sea bands of pirates, who were called Angles and Saxons. They were heathen and very fierce men, who destroyed and killed all along our eastern and southern coasts, and leaving their ships marched inland, burning and murdering. Gradually they subdued the whole country as far as the Tamar and the edges of the Welsh uplands and the Scottish Highlands.

As their numbers increased, the whole character of the country changed. Having been Britain—the home, that is to say, of the Celtic Britons—it became England, the land of the Angles, or Engles, or English. You note that the Saxons became

mixed with the Angles, who were evidently the stronger, for they gave their name to the whole country. But the land of the English in Britain included, you must remember, the southern part of Scotland and not merely England.

As the Angles and Saxons gradually settled in villages scattered over the country, they gave names to them. Let us consider a few of these later names. Many villages and towns have names which end in "ham," like Wokingham. Now "ham" is simply another way of pronouncing "home," and Wokingham meant the Home of the Wokings, a Saxon family who settled there. Other names end in "ton," thus we have Workington. Ton is, of course, simply "town," and Workington means the town of the Workings, an English family.

The Angles and Saxons divided England into counties, and the names of some of these counties are very interesting. We have said that the pirates came first to the east and south coasts. The oldest counties are therefore in those parts of the country.

First of all we have Norfolk and Suffolk, which mean the North Folk and the South Folk. These were two allied peoples, who were Angle in race, not Saxon. Their joint country was known as East Anglia, because there were other Angles farther west and north.

Then we have Essex. Now the word Essex used to be written *Essex*, and *Sexe* meant "Saxons," so that *Essex* meant East Saxons. *Middlesex* of course meant the Middle Saxons, and *Sussex* the South Saxons.

The only county which has a Celtic and not an Anglo-Saxon name is Kent, and this is natural, because Kent was the first part of Britain to which foreigners came, and therefore its name was known on the Continent. It was a name which the Saxons knew before they came to England, and therefore they continued to use it.

What the word *Surrey* means no one knows with certainty. The first part of it has something to do with South, but the meaning of the latter part has only been guessed at.

Farther west we have Hampshire, or, as it is called for short, *Hants*. We have already learned the meaning of the syllable "shire." Hampshire of course means the share of country which belonged to Southampton, because Southampton used to be called merely Hampton, until it became necessary to distinguish it from Northampton.

West of Hampshire again we find Wiltshire, Dorset, and Somerset. The old form of Wiltshire was *Wiltset*, and therefore we see that these three counties had similar names. At the end of each was the syllable "set," which you have also in the



word "settle," and in a little different form in the word "seat." Wiltset, Dorset, and Somerset, were the districts of the Wilt Settlers, the Dor Settlers, and the Somer Settlers, three Saxon peoples who colonized this part of the country.

All through the Midlands the counties are called shires, and are named after their chief towns. So we have Oxfordshire and Warwickshire. Berkshire is an exception, for there is no town of Berk. What Berk signifies no one knows for certain. The little county of Rutland means "red land."

When the Angles and Saxons were firmly settled in England and had been converted to Christianity, the fleets of yet other heathen pirates came across the North Sea. These were the Danes and the Norsemen. The Danes pushed up the navigable rivers in their boats, and in many parts formed Danish settlements, though they did not drive the Angles and Saxons out of the country as the Celts had been driven out.

You may know these Danish settlements by their names. For example, when you see that a town has a name ending in "by," like Derby and Whitby, you know that it was founded by the Danes. Most of the names ending in "by" are along the east coast, or on the rivers which drain to the North Sea, because the Danes did not often settle in the west of the country. Nor did they

establish colonies on the Thames, so that Danish names are not frequent in the south-east.

The Norsemen, or Northmen, who came at the same time as the Danes, settled, as we have already learned, chiefly in the islands north and west of Scotland. This was because ships could easily cross from Norway by the Shetlands to the North of Scotland, but from Denmark the Danes came most easily past the north coasts of Germany and Holland to the east coast of England. You should examine these statements upon the map.

You may know the Norse settlements by their place-names. For instance, the Norse word for an island is "ey." So we have the Orkneys. The Norse name for the Hebrides was the "Sudereys," which meant the South Islands, whereas the Orkneys and Shetlands were known as the Nordereys or North Islands.

Last of all came the Normans, who were also Norsemen, from Norway, but they had lived for several generations in France, in that part of the country which is called Normandy, and there they had come to speak French. The Normans very soon learned to speak English, and as they did not kill out the English and Danes, but merely conquered them, there are not many places in England which are called by French names. But there are a few. For example, in the New Forest of

Hampshire there is a place called Beaulieu, which means in French "the beautiful place."

The most striking result of the Norman conquest of England is to be found in the fact that the Channel Islands belong to England and not to France. They lie off the coast of Normandy, which was the home of William the Conqueror. After his time the French reconquered Normandy from the Norman Kings of England, but they were not able to take the Channel Islands, and these have ever since remained under the Crown of England, although their language is Norman French.

There are four of them, and they are called Jersey, Guernsey, Alderney, and Sark. Do you notice the curious fact that three of these names end in "ey," like the Orkneys. The reason, of course, is that when the Norsemen, or Normans, first came over the sea from Norway, they could not speak French, and therefore they spoke in their own language of these islands as "eys."

In one chapter or another of this book we have referred to most of the counties of the United Kingdom, but we have not given separate chapters to the counties of Wales and Ireland. These were formed comparatively late, and have not so interesting a history as the counties of England. You can learn about them best by examining them on the map.



Most of them are named after their county towns, as in the English Midlands, but a few, such as Merioneth in Wales, and Cavan and Fermanagh in Ireland, bear the names of ancient Celtic districts. You might examine them, as we examined the counties of Scotland in the First Part of this book, and see if any of them roughly correspond to river basins.

Think of all the villages, and towns, and rivers round your home, and see if any of them have names such as those explained in this chapter. So you will know that long ago there came into your neighbourhood either Celts, or Romans, or Angles and Saxons, or Danes, or Norsemen, or Normans.



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FIG. 115.—SALISBURY CATHEDRAL.

## CHAPTER XXXVIII. THE CATHEDRALS AND THE CASTLES.

WHY is there an Archbishop of Canterbury, and not an Archbishop of London? The reason is that Christianity was brought by missionaries to the heathen English very early, when as yet the various tribes had not been united into the Kingdom of England. The missionaries crossed over by the Strait of Dover. At that time Kent was a separate kingdom and not merely a county.

There were several other small kingdoms which have become counties, such as Sussex and Essex.



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FIG. 116.—ROCHESTER CASTLE.

Norfolk and Suffolk formed the Kingdom of East Anglia, and Wessex, or the Kingdom of the West Saxons, comprised the counties of Hampshire, Wiltshire, Berkshire, Dorset, and Somerset. Mercia was the Kingdom

of the Midlands, and in the north was Northumbria, of which we spoke in an earlier chapter.

The capital of Kent was Canterbury, and there the missionaries established themselves, only a short way from the Strait of Dover, at the Court of the King.

The name Canterbury was once spelt Cantwara-byrig. Now "wara" meant in the old English tongue "men," and "byrig" is the same as our word "burgh," or "borough," or "bury," so that Cantwara-byrig meant the borough or



town of the men of Kent. If you try to pronounce Cant-wara-byrig quickly, you will find that you come very near to Canterbury, especially if you remember that the "y" sounded like a "u." In the time when men could not write and spell, they naturally shortened so long a name.

Thus Canterbury became the first Bishopric of England, and sent missionaries forward to found new bishoprics in other places. They travelled by Watling Street, and came to Rochester, and then to London. In each of these places a bishopric was founded, which has lasted to our time. Canterbury was the mother church and these were her daughter churches, so that the Bishop of Canterbury became an Archbishop. York had a separate Archbishop, because Northumbria was a very important kingdom. You remember, of course, that it included part of Scotland.

We have said that the Normans changed very few names in England, but they changed many other things. For instance, they were great builders, and brought over a new and more splendid style of building. They did not put up large private houses, for in that time private houses were merely of wood, but they erected cathedrals and strong castles, because the chief people in the land were then the bishops and the barons. No one attacked the cathedrals, because, although the time was rough, yet England was Christian, and



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FIG. 117.—THE RUINS OF TINTERN ABBEY, BESIDE THE RIVER WYE.

therefore there was no need to fortify the cathedrals. But the barons often made war upon one another, and their castles were therefore fortified. In the troublous times of King Stephen a great number of castles were built all over the country. In more orderly times most of the strong castles belonged to the King, and were used to keep the barons in order. As the centuries went by the cathedrals were more and more delicately built and enriched with stained glass, but the castles were gradually replaced by beautiful country houses.

In the county of Kent we find the remains of a great castle at Dover. We have one of the finest cathedrals at Canterbury, and at Rochester we





FIG. 118.—SOME OF THE CHIEF CATHEDRALS, ABBEY RUINS, AND CASTLE RUINS IN BRITAIN.



have both a cathedral and the ruins of a castle. From Plate XXVI, p. 259, you will learn that in the North of England, at Durham, are also to be found side by side a cathedral and a castle.

But the Normans and their successors not only built fine cathedrals for the bishops, but also beautiful abbeys for the abbots and monks. Some of the most beautiful ruins in the land are those of abbey Churches—for example, at Glastonbury and Tintern, in the West of England.

Now I have no doubt that you are asking, “What has all this to do with geography and the map of England?” It has a great deal to do with it, because wherever a bishop built a cathedral, or an abbot built an abbey, or a baron or the king built a castle, there, for the sake of security, a large number of poor people gathered, and set up their wooden houses round the stone walls of the great church or the castle. In this way many of the towns of England were founded.

Therefore it is that in so many towns all over the country you find a cathedral, or the ruins of a castle or abbey. In some towns where there is not even a ruin left, you will find that there is a street called Castle Street, or Abbey Lane, or some other name of the kind, and you will learn from this that probably the town grew up in the same way as so many other towns, even although the ruin be gone.

Whenever you go to a new place you should always note these things, and try to think what the country was like before there were coal mines, and factories with tall chimneys, and railways, and railway stations. Think of it as a country of farmers, with little towns gathered round the cathedrals and castles and abbeys, and with only a few great cities such as London and Bristol.

These cities had their own mayors, and were not subject to bishops, or abbots, or barons. They usually had walls round them like the castles of the barons. In some places—at York, and at Berwick-on-Tweed for example—you will find the walls still standing.

In Fig. 118 are marked some of the chief cathedrals and ruins of Britain. We will persuade a friend to take us to see those in our own neighbourhood.

## CHAPTER XXXIX. THE BEACONS

THERE are few ways in which England of to-day differs more from England of the past, than in the ease with which we travel from one part of the country to another. In the days of Queen Elizabeth, England was not only without railways and telegraphs, but also without canals and without good roads. There were rough tracks by which goods were sometimes taken through the country on lumbering wagons, but for the most part they were carried in bales on the backs of packhorses, or else by sea and river. Passengers travelled either on horseback or by boat.

Yet our forefathers were able to convey a simple message through all the country in the space of a few hours by means of beacons. When the Great Armada was first sighted coming up the Channel, a message was sent up the nearest high hill, and that night a fire blazed on the hilltop, which was seen far away by watchmen on other hilltops. Each watchman had beside him a barrel of pitch,





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XXVII. WESTWARD VIEW FROM THE COTSWOLD HILLS.

*[Taunt, Oxford.]*



XXVIII. EASTERN ENGLAND, PHYSICAL.

to which he set a light. So the news was spread eastward to London, and northward to the Scottish border, in order that the whole country might prepare for invasion.

Lord Macaulay wrote a poem about the Armada in which he described how the beacons sent forward the message and roused England. Let us read it and find on the map as many as we can of the places which he mentions. You have already heard of most of them in previous chapters.

Night sank upon the dusky beach,  
And on the purple sea,  
Such night in England ne'er hath been  
Nor e'er again shall be.  
From Eddystone to Berwick bounds,  
From Lynn to Milford Bay,  
That time of slumber was as bright  
And busy as the day;  
For swift to east and swift to west  
The ghastly war-flame spread,  
High on St. Michael's mount it shone,  
It shone on Beachy Head.  
Far on the deep the Spaniard saw  
Along each southern shire,  
Cape beyond cape, in endless range,  
Those twinkling points of fire.  
The fisher left his skiff to rock  
On Tamar's glittering waves:  
The rugged miners poured to war  
From Mendip's sunless caves.

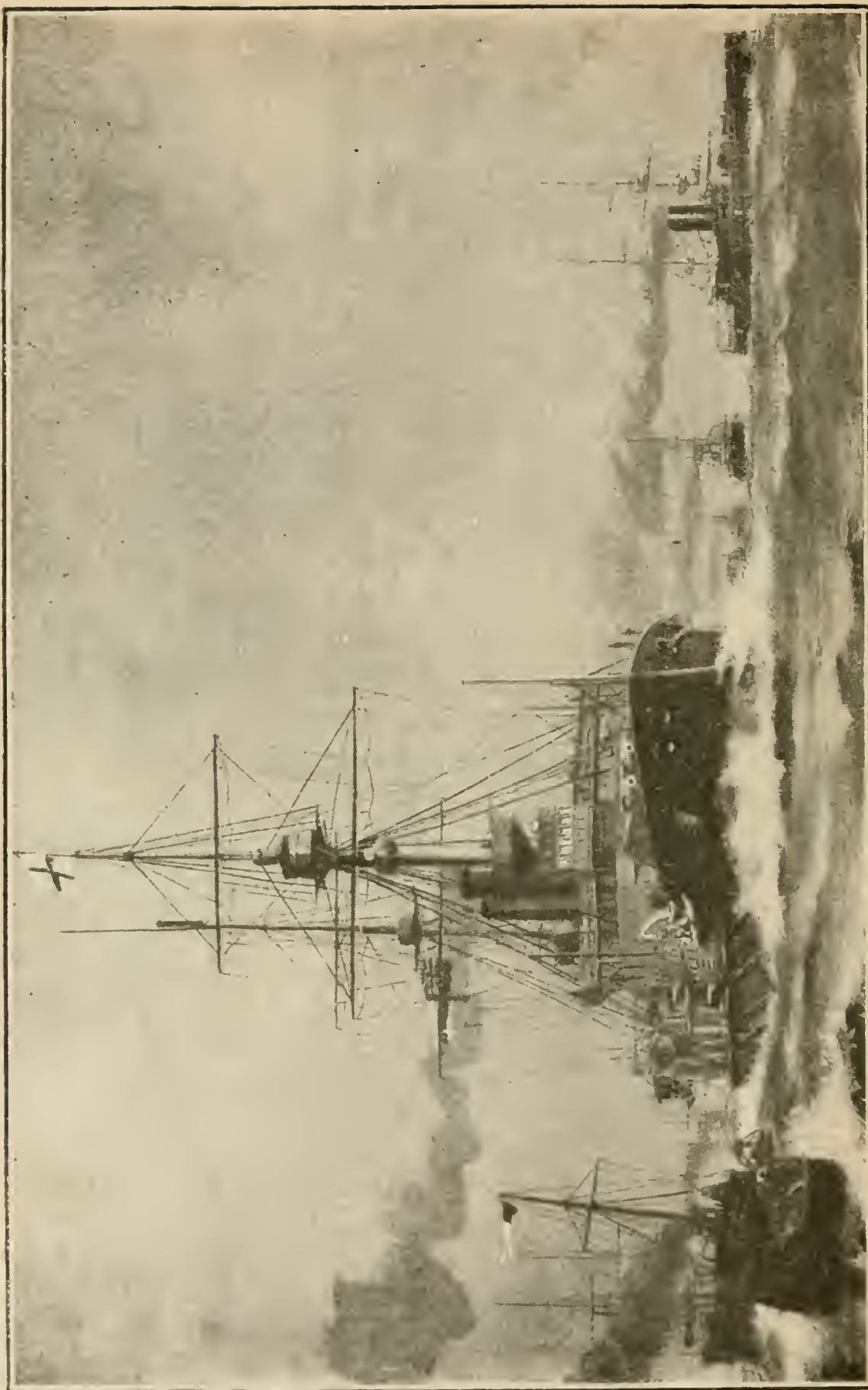




FIG. 119.—THE BEACONS.

O'er Longleat's towers, o'er Cranbourne's oaks,  
 The fiery herald flew :  
 And roused the shepherds of Stonehenge,  
 The rangers of Beaulieu.

Right sharp and quick the bells all night  
Rang out from Bristol town,  
And e'er the day three hundred horse  
Had met on Clifton Down.  
The sentinel on Whitehall Gate  
Looked forth into the night,  
And saw o'erhanging Richmond Hill  
The streak of blood-red light.  
And eastward straight from wild Blackheath  
The war-like errand went,  
And roused in many an ancient hall  
The gallant squires of Kent.  
Southward from Surrey's pleasant hills  
Flew those bright couriers forth ;  
High on black Hampstead's swarthy moor  
They started for the north ;  
And on and on, without a pause,  
Untired they bounded still ;  
All night from tower to tower they sprang,  
They sprang from hill to hill ;  
Till the proud Peak unfurled the flag  
O'er Darwin's rocky dales,  
Till like volcanoes flared to heaven  
The stormy hills of Wales ;  
Till twelve fair counties saw the blaze  
On Malvern's lonely height,  
Till streamed in crimson on the wind  
The Wrekin's crest of light,  
Till broad and fierce the star came forth  
On Ely's stately fane,  
And tower and hamlet rose in arms,



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FIG. 120.—A BRITISH SQUADRON AT SEA.

[Symonds & Co.]



O'er all the boundless plain ;  
Till Belvoir's lordly terraces  
The sign to Lincoln sent,  
And Lincoln sped the message on  
O'er the wide vale of Trent ;  
Till Skiddaw saw the fire that burned  
On Gaunt's embattled pile,  
And the red glare on Skiddaw roused  
The burghers of Carlisle.

There were many other Beacons besides those here mentioned by Macaulay. Many high hills still bear the name of beacon, for instance, Crowborough Beacon in Sussex, Inkpen Beacon where the counties of Berks, Hants, and Wilts meet, Dunkery Beacon in Somerset, and Brecknock Beacon in Wales. Have you any Beacon near you ?



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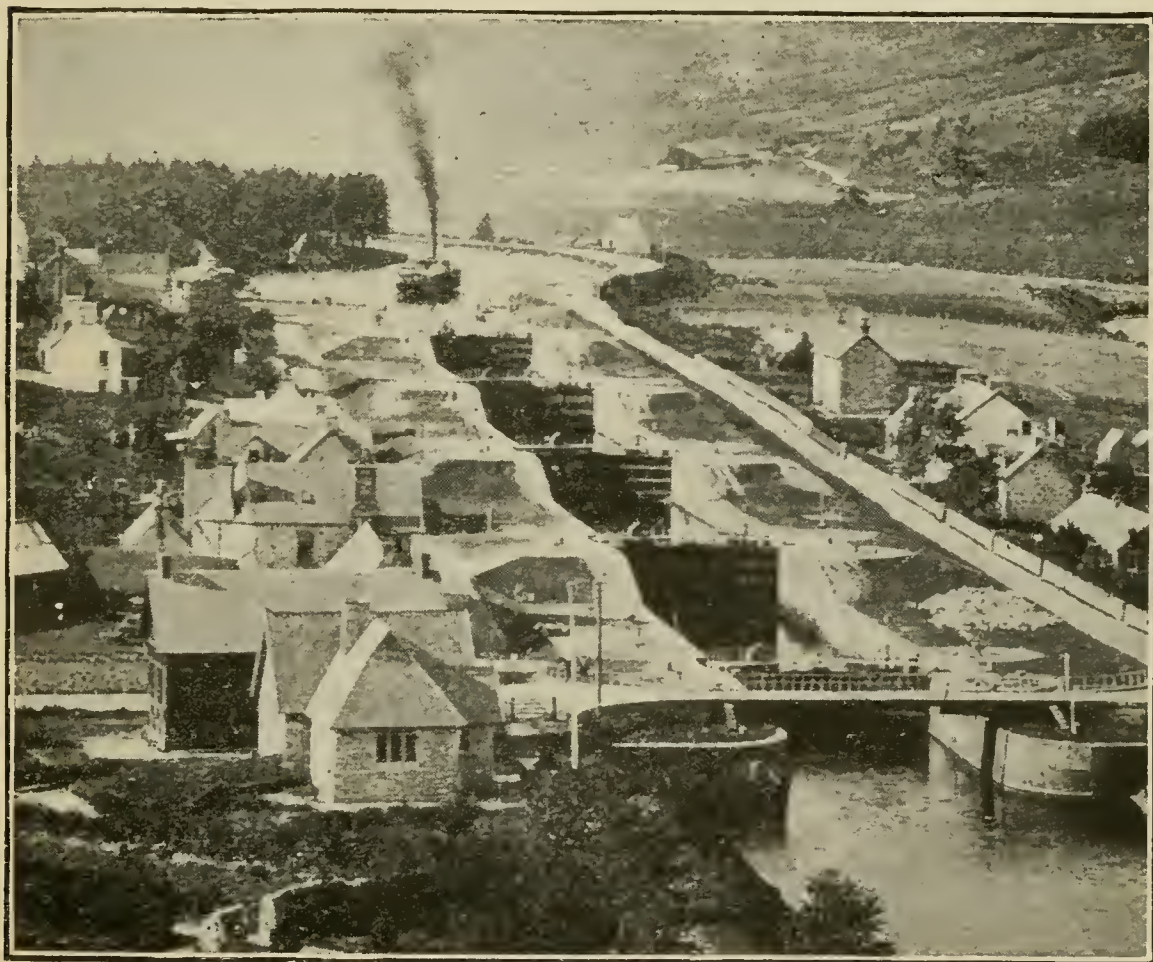
FIG. 121.—A ROMAN ROAD IN ITS PRESENT CONDITION.

## CHAPTER XL. THE RAILWAYS.

THE Romans made some fine roads through England for the movement of their troops, but when our barbarous ancestors arrived from over the sea they did not know how to repair these roads, which gradually fell into decay. Thus it happened that for many centuries England had no roads fit for wheeled traffic. Even the Strand, the short road from London to Westminster which ran between the houses and gardens of the great nobles, must have been a very bad road according to our modern ideas.



It was not until about two hundred years ago, in the reign of Queen Anne, that men began to improve the roads again, and to drive across the country from town to town in carriages. One of the men who did most for this great advance was called Macadam, and therefore well-made country roads are said to be macadamized.



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FIG. 122.—A STAIR OF LOCHS ON THE CALEDONIAN CANAL.

About one hundred and fifty years ago men found out how to smelt iron with coal instead of charcoal, and the manufacture of iron left the





FIG. 123.—A COACH AT NIGHT.

Weald forest and was established on the northern coalfields. A little afterwards a Scotchman, James Watt, invented the steam engine, which was soon used to bring coal up from the pits, and also to drive machinery for the spinning and weaving of cotton and wool. The towns of the north, such as Manchester, Sheffield, and Leeds, now began to grow quickly. It was necessary to bring food to them, and the raw material for their manufactures. Therefore the first canals were made, because goods are more cheaply moved in barges upon a canal than in wagons upon a road. The Bridgewater Canal, which is now owned by the Manchester Ship Canal Company, was the most celebrated of

the canals then made. It was constructed at the expense of the Duke of Bridgewater ; hence its name.

With the growth of the northern towns and the increase of business, it became necessary to carry letters more quickly than before. Therefore, a hundred years ago, four-horse coaches were employed to carry the mails along the roads. They travelled rapidly by day and night, the horses being changed every ten miles or so. Towns in which several main roads crossed one another must have been very lively places then. Think of twenty or thirty coaches rattling through the streets every day with their horns blowing ! They would pull up at the inns, and while the horses were being changed, passengers from all parts of the country would dine, and then the journey would be resumed. Some of the passengers would no doubt change coaches, just as we change trains.

Seventy-five years ago men began to make railways. The first railway for the carriage of passengers ran from Manchester to Liverpool. There are now over twenty thousand miles of railway in the British Isles. New lines are made from time to time, and there is no good in learning the *exact* number of miles of railway, first because it is always growing, and secondly because there is no particular use in remembering such numbers. We can easily find out from some book published

annually the exact number of miles of railway in Britain should we require to know it. We might ascertain, if you like, how many times the railways of Britain would stretch from Land's End to Cape Wrath.

The chief railways run out from London like the spokes of a great wheel. They belong to nine systems, whose names are :—

The Great Eastern Railway.

The Great Northern Railway.

The Midland Railway.

The London and North-Western Railway.

The Great Central Railway.

The Great Western Railway.

The London and South-Western Railway.

The London, Brighton and South Coast Railway.

The South-Eastern and Chatham Railway.

Why were so many railways made to London ? If you wish to go from one town to another it is often easier to go up to London by one line, and then down by another, than it is to go directly across the country. The express trains run chiefly along the main lines out of London, and most of the cross-country trains lose much time by stopping at little stations. Only in the populous manufacturing districts are there many express trains which do not go to or from London.



The reason is that London was already a great city with more than a million people when the first railways were made. People in the country wanted to go to London more often than to any other place, because more business was done there than in the smaller towns of the rest of the land. A great deal of food had also to be conveyed to feed so many people. So it was that the main lines were made to London.

At the London end of each of the railways a station is marked in Fig. 107, p. 237, which is called the terminus of the railway, because the line goes no farther. The other terminus of most of the railways is somewhere on the coast—at Brighton or Dover, for example. The word *Terminus* is Latin, and means end.

But what has been the result of making all these railways to London? It has been to make London grow larger than ever before, so that from a million inhabitants it has grown in a century to have seven million. People settle in London from all parts of the country, and indeed from all parts of the world, because customers are able to go to London very easily, and therefore it is a good place for business. Happily trains, and tramcars, and bicycles now enable many people to live in the country, and they only go into London for their work. This is much better for the nation, because it is more difficult to bring up children healthily

in the crowded parts of great cities. But there are many healthy places in the suburbs.

London has, of course, no collieries, and therefore those kinds of manufacture which require much coal are not generally carried on in London. About half the coal that is burnt in London is brought there by sea, chiefly from Newcastle-on-Tyne, and the rest is carried by the railways. Coal has lately been found near Dover, and it is possible that there may some day be industries on a great scale in Kent, if coal is ever worked there in sufficient quantity.

The railways of Scotland and Ireland have different names from those of England, and if you live in either of the countries you should get your teacher to show you how the chief lines run. Whenever you learn the geography of a country you should always look at the map to see how the railways avoid the hills and take advantage of the plains and valleys.

You remember, of course, that we read in an earlier chapter of the west coast railway to Scotland, most of which belongs to the London and North-Western Company, but the Scottish end belongs to the Caledonian Company. Now the west coast line avoids the Pennine moors by keeping to the Lancashire plain. It goes over Shap Fell because that is the lowest passage between the Lake Mountains and the Pennine





Fig. 124.—A FEW OF THE CHIEF RAILWAYS OF BRITAIN.

Add any important railways in your own neighbourhood.



Range. Then it runs down the Eden Valley to Carlisle, and up Annandale. It crosses the Southern Uplands of Scotland by the pass of Beattock, and then runs down Clydesdale into Glasgow. It would be well to look at this part of the map again, and then you might examine your own part of the country and see how the railways run round the hills, or across the plains, or up the valleys.

Sometimes, of course, a railway cannot avoid a hill, and then a tunnel or else a cutting must be made. There are several long tunnels under the Pennine Range. They have cost a great deal of money to make, but the railways have there much traffic, for they join together the populous districts of Lancashire and the West Riding of Yorkshire.

The longest tunnel in the British Isles has been made under the Severn, because a direct way was needed from London and Bristol to the busy coal-field of South Wales. The Severn Tunnel is more than four miles long.

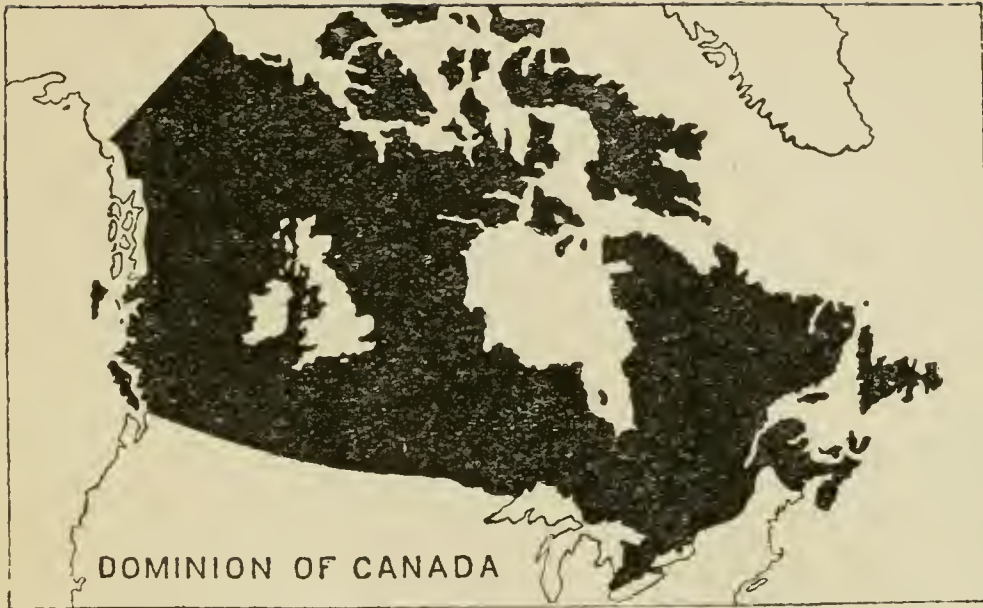


FIG. 125.—CANADA.

## CHAPTER XLI. AREA

THERE is one other question which it would be well to ask of the map before we close this book. You will remember that in Chapter XXIV we said that although Scotland is longer than Ireland, yet on account of the firths of the sea which penetrate inland, Scotland does not contain quite as much land as Ireland. Clearly then it is not enough to measure the length of a country, but we must know how much space there is in it. Let us find out how to do this.

In Fig. 126 we have in the centre a square mile drawn to the scale of a mile to the  $\frac{1}{4}$  inch. To the

left we have another square on the same scale, but measuring two miles each way. You see at once that it has an area of four square miles. To the right we have yet another square, but drawn to the scale of ten miles to the  $\frac{1}{2}$  inch. If you examine it, you will see that although each side represents a length of only ten miles, the area represented by the square is 100 square miles. Make a tracing of this square, and draw nine lines across from top to bottom with a sharp pencil, and nine lines from left to right. You will have divided it into 100 little squares.

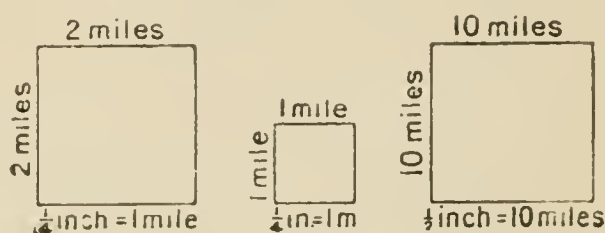


FIG. 126.—AREA.

Now take a length of 100 miles as shown on the scale in the corner of one of the maps of the British Isles, and mark this off on the corner of a piece of paper. You can now tear off a neat square of paper, which will measure 100 miles each way according to the scale of the map. It will of course contain 100 times 100 square miles—that is to say, 10,000 square miles.

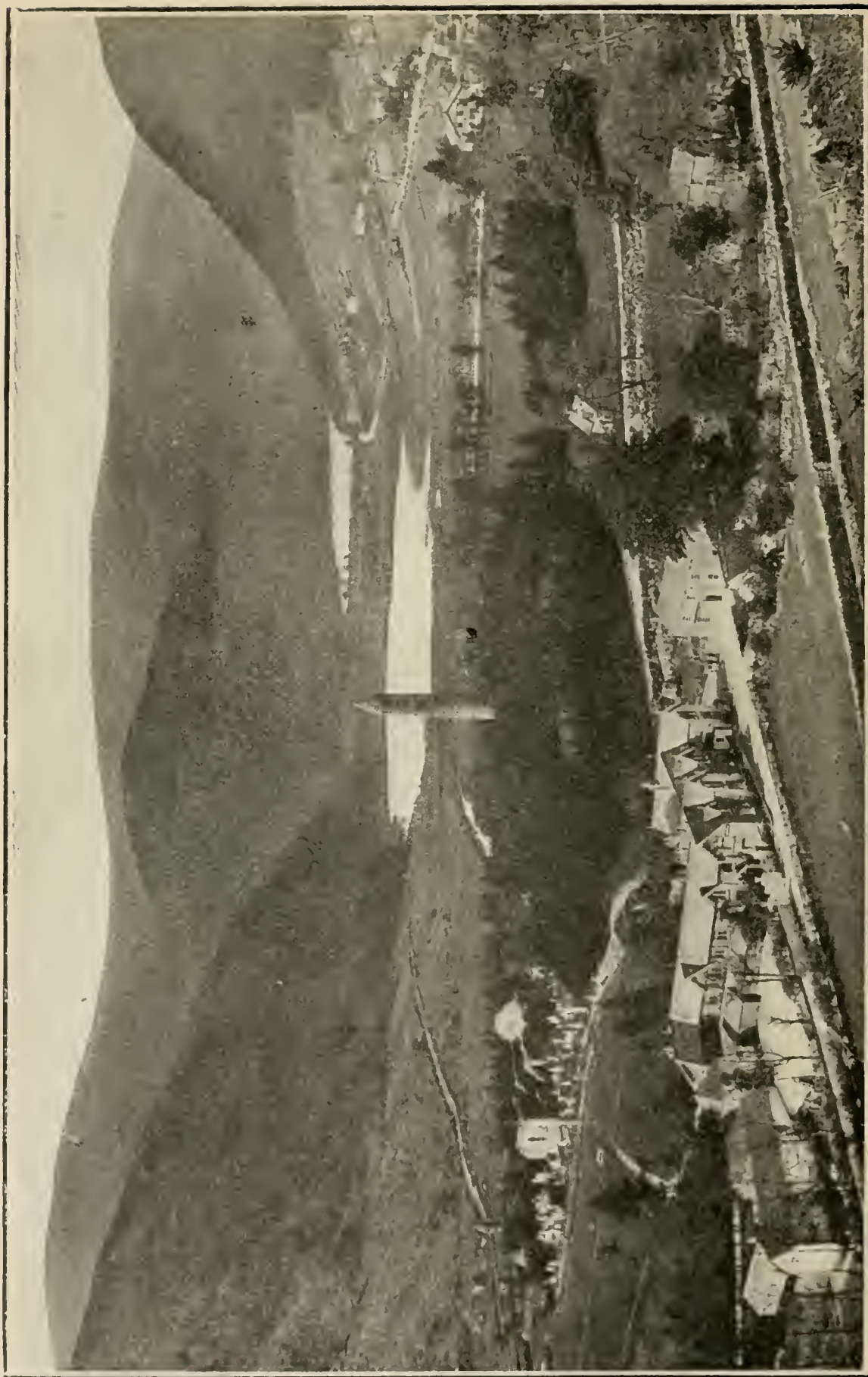
Lay this square upon the map by the side of Wales. You will see at once that if you allow





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XXIX. LONDON AND NORTH-WESTERN EXPRESS PICKING UP WATER.  
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XXX. GLENDALOUGH.

[W. Lawrence.



for the bays, it is a little larger than Wales. This means, of course, that Wales has an area of a little less than 10,000 square miles.

Next lay the square over the north of Ireland, then over the centre, and then over the south. You will learn in this way that Ireland measures about 30,000 square miles, or three times the square of paper.

Do the same thing for Scotland, and you will see that Scotland also measures about 30,000 square miles. Ireland is, as we said, a very little larger than Scotland, but we are only making a rough measurement, and roughly they are equal.

Finally, place the square upon England, and try to make up your mind as to the size of that country; it is, of course, the largest of the countries which form the United Kingdom. If you judge rightly, and if you then set down on paper the areas of Wales, Ireland, Scotland, and England, and add the numbers together, you should come to the conclusion that the area of the whole British Isles is about twelve times as large as the square of paper which measures 100 miles each way. What then is the area of the British Isles expressed in thousands of square miles? Your teacher will tell you if you are right.

The British Isles are, of course, only a very small part of the world. There is about 430 times as much land on this round globe of ours as there



is in these islands. If you multiply the sum out you can find how many square miles of land there are in the world.

But the ocean covers a great deal more space than the land. It is nearly three times as large as all the land in the world. Therefore if you multiply the number of square miles of land by four, you will get the whole area of the surface of the globe.



FIG. 127.—SOUTH AFRICA.

If you have found the right answers to each of these sums, you will have learned that the surface of the globe measures a little less than two hundred million (200,000,000) square miles.

Though the British Isles are so small, yet the British Empire is very large. In the little maps of this chapter and the next we have some of the

chief parts of the British Empire drawn to the same scale as the British Isles. You see that the two islands of New Zealand are about as large as our own two islands, but that the British lands in Canada, Australia, India, and South Africa are very much larger.

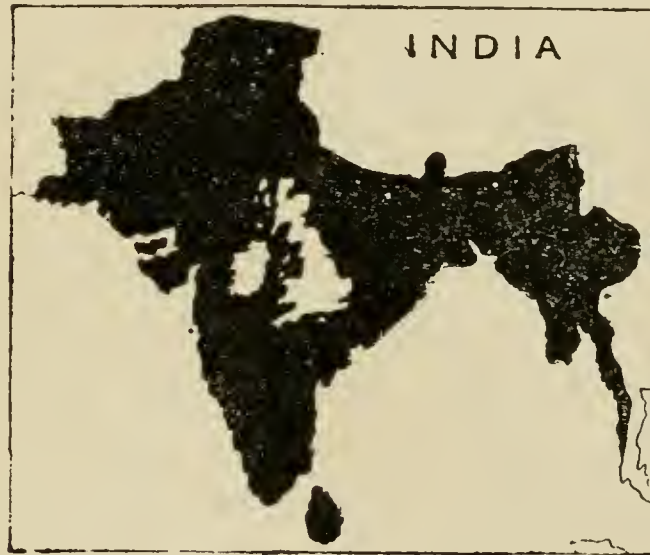


FIG. 128.—INDIA.



FIG. 129.—AUSTRALIA.

## CHAPTER XLII. POPULATION

EVERY ten years the population of the British Isles is counted. We speak of this counting as the Census. The last census was taken on the night of April 1, 1901, and the next will be taken in 1911. The day before the census a paper is left in each house, and the head of the house has to fill it up, saying how many people slept there on the night appointed for the census. The papers are collected next day, and the numbers are counted and added together. It takes several weeks to make the first count, and afterwards the numbers are re-counted in order to be sure there are no mistakes.

In 1901 there were about forty-two million men, women, and children in the British Isles, and there were nearly 400,000 men who were



away from Britain, serving for a time in our navy, our army, and our merchant ships.

More people are born each year than die, and therefore the population is now more than forty-two millions. In the year 1906 it is probably about forty-three millions (43,000,000), but perhaps you may read this book in some later year. In that case you should find out from some Almanack, or other book published every year, what is the probable population at the time.

There lived in England in the year 1901 thirty-one millions, or very nearly three-quarters of the population of the whole British Isles. In Wales there were not quite two millions, in Scotland about four and a half millions, and in Ireland also about four and a half millions.

You see that the populations of Ireland and Scotland are almost the same, but the population of Scotland is increasing, while that of Ireland is decreasing, because a good many Irishmen emigrate and become colonists in new countries. There is very little coal in Ireland, and the whole country is mainly agricultural. The population is decreasing in the agricultural districts of England and Scotland, but in the towns, owing to their manufactures, it is growing rapidly. Now since England and Scotland have many towns their populations are increasing, notwithstanding the decrease in the rural districts.

About seven millions dwell in London and its suburbs, or about one in every six of the people of these islands. There are three other cities each of which, with its suburbs, has nearly one million people—Glasgow, Manchester, and Liverpool. Three-quarters of all the people of Britain live in the towns, large and small, and only one quarter on the farms and in the villages. Therefore it is very important indeed that the towns should be as healthy and beautiful as we can make them. But there are many ways in which a country life is better than even the best life in a big town.

If all the people of Britain were scattered quite evenly over its surface there would be about 360 of them on each square mile. This you can easily find out for yourself by dividing 43,000,000 by 120,000. The short way of stating this is to say that the average density of population in the British Isles is nearly 360 to the square mile. A crowd is dense when it is packed tightly together, but it is not so dense when it is more scattered. You should look in the dictionary for the meaning of the word Average.

But the people are, of course, not thus evenly spread over the whole land. They are gathered together very closely in certain parts, while in others the population is very sparse. In the county of Sutherland, for instance, there are only about

20,000 people, although the county measures about 2,000 square miles. The density of population in Sutherland is therefore about ten to the square mile. On the other hand, Lancashire, which has an area almost exactly the same as that of Sutherland, has a population of nearly four and a half millions. You can find for yourself, therefore, that Lancashire has a density of population which is about 2,250 to the square mile.

The densest population of all is in the County of London, which measures about 120 square miles. There sleep within this space every night about four and a half millions of people. Let us calculate the density of population in the County of London.

In the day time there are even more people in London than this, for a great many of those who are employed in the City and other central parts of the Metropolis, go out by tram or train in the evening to sleep in suburbs beyond the county boundary. You will remember that there are about seven million people in Greater London.

The people are crowded together in London because of the commerce which is done there, and because the British Empire is ruled there. They are gathered together in Lancashire because of the manufactures which are carried on there. They are, however, scattered in Sutherland, because there is neither commerce nor manufacture there,



and there is very little agriculture, because the ground is chiefly highland.

The British Isles are on the whole a crowded country, although certain portions of them, like Sutherland, are very sparsely peopled. But there is plenty of room in other parts of the Empire. The whole of Canada, for example, has a population which in the present year (1906) is not yet quite equal to that of Greater London. Yet you may see in Fig. 125, p. 289, how small are the whole British Isles when compared with Canada. There is much fertile soil in Canada, and there is coal there. The reason for the sparsity of population is not, as in Sutherland, that the land is sterile, but merely that it has not yet been occupied.

Those who can find work to-day in Britain should stay here among their friends, but those who have not work should cross the ocean and make new homes for themselves in Canada, or Australia, or New Zealand, or South Africa. In all these lands they will remain the subjects of our King, Edward VII; the same flag will be theirs, and they will not be among foreigners.



FIG. 130.—NEW ZEALAND.

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